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Basal Implants: A Narrative Review

Anita Gala Doshi, J.R. Patel, Gabriela Fernandes, Vivek Gaur

Abstract:

Basal Implants Are A Relatively New Type Of Dental Implant That Offer Several Advantages Over Conventional Implant Systems. These Implants Are Designed To Be Placed In The Basal Bone, Which Is Denser And More Stable Than The Conventional Bone In The Jaw. Recent Advances In Basal Implants Have Focused On Improving Their Design, Materials, And Surgical Techniques. For Example, Newer Implants Are Made From Stronger And More Biocompatible Materials, Such As Titanium Alloys And Zirconia. These Materials Can Promote Better Osseointegration, Which Is The Process By Which The Implant Fuses With The Surrounding Bone Tissue. In Addition, Advances In Surgical Techniques Have Allowed For More Precise And Minimally Invasive Implant Placement. This Has Therefore Reduced The Risk Of Complications, Shortened Recovery Times, And Improved Overall Patient Outcomes. Another Notable Advancement In Basal Implants Is The Use Of Computer-Aided Design And Manufacturing (CAD/CAM) Technology. This Technology Allows For The Creation Of Custom Implants That Are Tailored To The Patient's Unique Anatomy, Resulting In Better Fit And Improved Function. Hence, These Advances In Basal Implants Have Made Them An Increasingly Popular Choice For Patients With Complex Dental Needs Or Those Who Are Seeking A More Permanent And Stable Tooth Replacement Option. This Review Aims To Summarize The Current Advances In The Field Of Basal Implantology. Key-Words: Basal Implants, One-Piece Implants, Cortical Bone

I. Background:

The basal bone is very strong and hence constitutes the stress bearing part of our skeleton. Dental Implants when placed in this bone can be loaded with a prosthesis immediately (within 72 hours) and can therefore avoid the need for a 2nd surgery to fix the abutment. Moreover, this innovative procedure precludes the use of bone grafting/augmentation thus making it a minimally invasive procedure. This science of immediate weight bearing on implants is already proven in orthopedic implants like the hips/knees. A need for a similar detailed study with a prolonged follow-up is essential for the acceptance of dental basal implants. Presently, implant treatment has now become the gold standard in replacing missing tooth(1,2). In cases of severe alveolar resorption, implant placement especially below the maxillary sinus still remains a challenge in dental implantology(1,3). The posterior maxilla very often provides limited bone height and poor bone quality which compromises the primary stability of the implant. Moreover Maxillary sinus pneumatization can complicate this problem(1,4-6). The conventional Maxillofacial therapy consists of bone grafting from either the hips tibia ribs or chin in combination or prior to impant insertion(1). These procedures were initially presented by Tatum et al. in the 1970s and first published by Boyne &James1980.

In1994, Summers introduced the osteotome sinus floor elevation via a crestal and flapless approach(1,5,7,8). But bone augmentation procedures are associated with a number of disadvantages. It requires two independent invasive surgeries, that cause not only a prolongation in treatment time, but also additional costs and discomfort for the patients(3,9-11). Moreover, it's never proved that augmentation procedure make dental implant treatments safer. Many Post-operative complications are reported in literature such as wound dehiscence, acute and chronic sinusitis, mucocele formation, swelling, loss of graft material into the sinus causing disruption of normal physiological sinus function, and graft infection(7,12,13). Also in certain cases, where treatment needs to be attempted, to resolve a situation after the failure of an all-on-four-type construction (conventional implants), the patient will not typically opt to have another multistage surgical procedure such as an extensive bone-block transplant followed by conventional two



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stage implants again since it would be too expensive. Therefore, as a minimally invasive alternative, treatment with immediate loading implant surgery and achieving masticatory function becomes a priority(14).

Basal Implants have demonstrated excellent results in controlled diabetics, in smokers, in chronic destructive periodontitis and in patients who have little or no bone for conventional implants (Table 1 and 2). Furthermore, the smooth surface design of these implants prevent bacterial colonization (prevents retrograde infection). So part of this smooth polished implant can stay in the maxillary sinus or above the nasal floor without the risk of infection thus assigning a 98% lesser chances of peri-implantitis and hence lower failure rates. There is a current lack on these kind of long term studies globally and most of the published studies are in German or French. Not a single long term study has been conducted here in India. It's an answer to the hopeless and rejected patients that do not qualify for conventional implants and hence have no chance of an improved existence with a full set of teeth and facial profile. Furthermore, evaluating bone condition is essential in the pre-operative stage and during the follow-up stage after implant placement. In this sense, Imaging techniques are relaible tools for evaluating peri-implant tissue. A 3-dimensional visualization of the bone is required wherein a conventional and cone beam computed tomography (CBCT) is the modality of choice. Recently, CBCT scans have also been studied for their ability to noninvasively measure the thickness of palatal mucosa in different locations, and have been found to be accurate. A comparative analysis of imaging techniques done for diagnostic accuracy of periimplant bone defects showed CBCT to be a clinically acceptable performance for assessing these bone defects. For assessment of mechanical bone quality also, CBCT shows similar results as compared to other available methods. Via this, we will be able to check for changes in the bone visible with the help of successive CBCT scans compared over a stipulated period of time and we will be able to create evidence of this new science.

Difference between conventional and basal dental implants:

Conventional dental implants have been used successfully for several decades to replace missing teeth. However, with the advent of basal implants, a new option has emerged for patients with poor bone quality, systemic diseases or those who are not suitable for conventional implants. Here, we will discuss the differences between conventional implants and basal implants.

Implant design:

Conventional implants have a cylindrical or tapered shape and are placed in the bone using a two-stage surgical technique. Basal implants, on the other hand, have a unique design with a wider base and a tapered shape. They are placed in the basal bone using a one-stage surgical technique.

Bone anchorage:

Conventional implants rely on osseointegration for stability, which means they need a certain amount of bone mass and quality to achieve adequate anchorage. Basal implants, on the other hand, rely on cortical bone anchorage and can achieve stability in poor quality bone. Surgical technique:

Conventional implant placement requires a two-stage surgical technique with a waiting period of 3-6 months before the prosthetic restoration can be placed. Basal implants, on the other hand, use a one-stage surgical technique and can be loaded immediately after placement. Prosthetic options:

Conventional implants can support a variety of prosthetic options such as single crowns, bridges or dentures. Basal implants, on the other hand, are designed primarily for full arch restorations with a minimum of four implants.

Success rate:

The success rate of conventional implants has been well-documented in the literature and ranges from 95-98%. The success rate of basal implants is also high, with reported success rates ranging from 92-98%.

Bone preservation:

Conventional implants require a certain amount of bone preparation and may lead to bone loss over time. Basal implants, on the other hand, preserve bone and may even stimulate new bone growth.

In conclusion, both conventional and basal implants have their advantages and disadvantages. Conventional implants are a reliable option for most patients with adequate bone quality, while basal implants are a viable option for patients with poor bone quality or systemic diseases. While conventional implants offer a wide range of prosthetic options, basal implants are designed primarily for full arch restorations. Ultimately, the choice between conventional and basal implants depends on individual patient factors, and a thorough evaluation by a dental professional is necessary to determine the best option for each patient. History of basal implants:

First single-piece implant was developed and used by Dr. Jean-Marc Julliet in 1972. Since no homologous cutting tools were produced for this implant, its use was fairly demanding. In the mid-1980s French dentist, Dr. Gerard Scortecci, invented an improved basal implant system complete with matching cutting tools. Together with a group of dental surgeons, he developed the Disk-implants. Since the mid-1990s, a group of dentists in Germany have developed new implant types and more appropriate tools, based on the Disk-implant systems. These efforts then gave rise to the development of the modern BOI (Basal Osseointegrated Implant or lateral basal implants. In this design, load transmission was supposed to take place both in the vertical and in the basal implant part. Soon Dr.Stefan Ihde introduced bending areas in the vertical implant shaft. In 2005 the lateral basal implants were modified to screwable designs (BCS) (15). Screwable basal implants (BCS® brand) are flapless implants and are placed through gum, without an incision. It's a one piece basal screw implant in which the cortical load transmission is done through the large basal threads. Those threads should be anchored in the cortical plate opposite to the crest. Some BCS implants provide lengthy holes or grooves in the threads for the in-growth of vessels or bone. Load transmission along the polished vertical shaft is not required for the functioning of this implant-type. They feature some structural elasticity and they have in common that masticatory loads are transmitted into the basal bone and into resorption free bone areas. It's based essentially on the principle of bicortical stabilization with consequent protection of the healing processes. For use as Zygoma-Implants, an aggressive thread for zygomatic anchorage and a bending zone near the abutment is designed. The bending zone allows insertion from the palatal aspect of the maxillary alveolar crest and subsequent bending of the implant. This way, the head reaches the crest and fits under the prosthetic construction(15). Several authors have recommended basal implant and bicortical implant anchorage (crestal bone and sinus floor) to get implant stability so implants may penetrate into the nasal and maxillary sinus cavity(1,16-19). The smooth surface of the BCS implants permits a fast soft tissue attachment around the implant. The seal of this attachment which is based on difference in the penetration depths and new regenerated bone surrounding the thread of all the implants leading to increase bone implant contact is observed. Khairnar and Gaur(20) reported that there was significant bone formation after indirect lifting of the nasal membrane with smooth polished surface of bi-cortical implants and that very good primary stability of the implant is obtained by means of its bicortical support.

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contact has been reported for bi-cortically anchored implants in rabbits. Moreover, Zhong et al, reported that a surgically disrupted membrane around the apical portion of an implant healed again and covered the tips of the implants provided the protruding depth is less than 2mm. Jung et al(21-24) reported that the implants penetrating into the sinus floor less than 2mm were covered by the sinus mucosa in mongrel dogs. Scans showed that implant protrusion of more than 4mm in the maxillary sinus can cause thickening of the sinus mucosa around the implants. However these sinuses remained asymptomatic(1,25,26).

Computed tomography was available for 3-dimensional dental imaging in the 1980s, but due to the high cost, limited access, and radiation exposure, utilization was limited to management of craniofacial anomalies, complex surgeries, and other unique dental situations. In 1988, cone beam computerized tomography (CBCT) was introduced to dentistry. This technology offered 3-dimensional visualization and more complex and more accurate imaging compared to analog and digital radiographs. CBCT is an accurate and useful tool for many clinical oral-maxillofacial indications, including the identification of anatomical structures and locations prior to implant placement and other oral surgery procedures, prior to and during endodontic procedures and when planning treatment for orthodontics.

Characteristics:

Basal implants are a type of dental implant that has been developed to address the challenges of conventional implants in patients with poor bone quality or quantity. Basal implants have gained popularity due to their unique design and high success rate. In this literature review, we will discuss the characteristics of basal implants.

Implant design:

Basal implants have a unique design that differs from conventional implants. Basal implants have a wider base and a tapered design, which allows for immediate stability and anchorage in cortical bone. The implant design also allows for immediate loading and osseointegration. Basal implants are a type of dental implant that has been developed to address the challenges of conventional implants in patients with poor bone quality or quantity. The implant design of basal implants plays a critical role in their success rate and clinical outcomes. In this literature review, we will discuss the implant design of basal implants. a) Tapered design:

Basal implants have a tapered design that allows for better anchorage in cortical bone. The tapered design also allows for better stress distribution and reduces the risk of implant failure. The implant design also allows for immediate stability and anchorage in cortical bone, which allows for immediate function and osseointegration. b) Wide base:

Basal implants have a wider base compared to conventional implants. The wider base provides better stability and anchorage in cortical bone, which reduces the risk of implant failure. The wider base also allows for better stress distribution and reduces the risk of bone loss. c) Bicortical anchorage:

Basal implants rely on bicortical anchorage for stability and anchorage. The implant is placed in a way that it is in contact with both the cortical and cancellous bone, which provides better stability and anchorage. Bicortical anchorage also allows for better stress distribution and reduces the risk of implant failure. d) Immediate loading:

Basal implants allow for immediate loading and osseointegration. The immediate loading of basal implants reduces the treatment time and cost for patients and allows for immediate function. The implant design of basal implants allows for immediate stability and anchorage in cortical bone, which allows for immediate loading. e) Biocompatible materials:

Basal implants are made of biocompatible materials such as titanium, zirconia or ceramic. These materials have been shown to be safe and effective for dental implant placement and have a high degree of osseointegration. f) Single-piece design:

Basal implants have a single-piece design that eliminates the need for abutments. The singlepiece design reduces the treatment time and cost for patients and allows for better stress distribution. The single-piece design also reduces the risk of implant failure and bone loss. Overall, the implant design of basal implants plays a critical role in their success rate and clinical outcomes. The tapered design, wide base, bicortical anchorage, immediate loading, biocompatible materials, and single-piece design of basal implants allow for better stability, anchorage, stress distribution, and reduced treatment time and cost for patients. The early clinical outcomes of basal implants are promising, and more long-term studies are needed to evaluate the clinical outcomes and effectiveness of basal implants.

Biocompatible materials:

Basal implants are made of biocompatible materials such as titanium, zirconia or ceramic. These materials have been shown to be safe and effective for dental implant placement and have a high degree of osseointegration. Basal implants are a relatively new type of dental implant that are inserted into the basal bone of the jaw. They have been gaining popularity due to their unique design, which allows for immediate loading and high stability, even in cases of severe bone loss. However, to ensure the long-term success of basal implants, biocompatible materials must be used(27). Biocompatible materials are those that can be used in the body without causing any harmful effects or rejection by the immune system. In the case of basal implants, the materials used must be able to integrate with the surrounding bone tissue and provide a stable foundation for the implant. One of the most commonly used biocompatible materials in basal implants is titanium. Titanium is a strong, lightweight metal that is highly resistant to corrosion and has excellent biocompatibility. It is commonly used as the material for the implant post, as well as for the abutment and crown. Another biocompatible material used in basal implants is zirconia. Zirconia is a type of ceramic that is highly resistant to wear and has a similar appearance to natural teeth. It is often used for the abutment and crown, as it provides a natural-looking and highly aesthetic result. In addition to titanium and zirconia, other biocompatible materials that have been used in basal implants include tantalum, niobium, and various bioceramics. Tantalum and niobium are both highly biocompatible metals that are used in medical implants due to their excellent corrosion resistance and low toxicity. Bioceramics, such as hydroxyapatite and tricalcium phosphate, are also highly biocompatible and can be used to promote bone growth around the implant. Several studies have investigated the use of different biocompatible materials in basal implants. One study compared the use of titanium and zirconia abutments in basal implants and found that both materials had similar success rates and clinical outcomes over a five-year follow-up period. Another study compared the use of titanium and tantalum implants and found that both materials had similar levels of osseointegration and stability(28,29).

Zhong et al(4) et al stated that higher removal torque values and greater bone-to-implant

Overall, biocompatible materials play a critical role in the success of basal implants. Titanium

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and zirconia are the most commonly used materials, but other options, such as tantalum and bioceramics, may also be suitable. Further research is needed to fully understand the long-term performance of these materials in basal implants.

Cortical bone anchorage:

Basal implants rely on cortical bone anchorage for stability and anchorage. Cortical bone is denser and stronger than cancellous bone, which allows for better osseointegration and reduces the risk of implant failure. Basal implants are placed in a way that they are in contact with the cortical bone, which provides stability and anchorage.

Basal implants are a type of dental implant that differs from traditional implants in their placement and the use of cortical bone anchorage. Cortical bone anchorage refers to the anchoring of the implant in the cortical bone, which is the dense outer layer of bone that surrounds the inner spongy bone. In this literature review, we will discuss the role of cortical bone anchorage in basal implants and its effectiveness(30,31).

Cortical bone anchorage is one of the main features of basal implants, and it is thought to provide greater stability and support compared to traditional implants that are placed in the spongy bone. Several studies have shown that cortical bone anchorage results in a higher success rate and better implant stability compared to traditional implants. A study by Ihde et al. (2010) reported a success rate of 97.8% for basal implants anchored in the cortical bone, which is higher than the reported success rate for traditional implants.

In addition to providing greater stability, cortical bone anchorage also allows for immediate loading of the implant, which means that a crown or bridge can be placed on the implant shortly after placement. This is possible because cortical bone has a higher density and is more resistant to stress compared to spongy bone, making it more capable of supporting immediate loading.

However, cortical bone anchorage also has some disadvantages. One of the main challenges of cortical bone anchorage is the limited amount of cortical bone available in certain areas of the jaw, particularly in the posterior mandible. This can make it difficult to place the implant in the optimal position, leading to a higher risk of implant failure. Additionally, there is a risk of cortical bone resorption, which can occur if the implant is not properly positioned or if there is a lack of proper occlusal loading.

Several techniques have been developed to overcome these challenges and optimize cortical bone anchorage in basal implants. One such technique is the use of angled implants, which allow for better placement in areas with limited cortical bone. Another technique is the use of bicortical anchorage, which involves anchoring the implant in both the cortical and spongy bone layers for increased stability.

One-stage surgical technique:

The surgical technique for basal implants is a one-stage surgical technique. The implant is placed directly into the basal bone with minimal bone preparation. The one-stage surgical technique reduces the treatment time and cost for patients and allows for immediate function and osseointegration.

Immediate loading:

Basal implants allow for immediate loading and osseointegration. The immediate loading of basal implants reduces the treatment time and cost for patients and allows for immediate function. The immediate loading also reduces the risk of implant failure and bone loss. Immediate loading has several advantages over delayed loading, which is the traditional approach where a crown or bridge is placed on the implant several months after placement to allow for osseointegration. One of the main advantages of immediate loading is that it reduces the treatment time for the patient. Patients can receive their new teeth on the same day as implant placement, which is a significant improvement over traditional implants that require several months of healing before the final restoration can be placed.

Several studies have evaluated the effectiveness of immediate loading in basal implants. A study by Ihde et al. (2010) reported a success rate of 97.8% for basal implants with immediate loading. Another study by Maló et al. (2011) reported a success rate of 98.4% for immediate loading of full arch implant-supported fixed prostheses. These results demonstrate that immediate loading can be a successful approach for basal implants.

However, immediate loading is not without its challenges. One of the main challenges is ensuring proper implant stability to support immediate loading. A study by Degidi et al. (2013) reported that implant stability was a key factor in the success of immediate loading in basal implants. Proper implant placement, surgical technique, and implant design are all important factors in achieving adequate implant stability for immediate loading.

Another challenge of immediate loading is the risk of implant failure due to excessive loading or occlusal forces. Proper occlusal adjustments and patient education are important to prevent implant failure due to excessive forces.

In conclusion, immediate loading can be a successful approach for basal implants, providing several advantages over traditional delayed loading. However, proper implant stability and occlusal adjustments are critical to ensuring success. Further research is needed to evaluate the long-term effectiveness of immediate loading in basal implants and to optimize implant placement and surgical techniques to achieve optimal implant stability. Prosthetic options:

Basal implants are designed primarily for full arch restorations. The prosthetic options include fixed prostheses such as bridges, hybrid prostheses, or removable prostheses such as overdentures. The prostheses can be supported by as few as four implants, which reduces the treatment time and cost for patients.

In conclusion, basal implants have unique characteristics that differentiate them from conventional implants. The wider base and tapered design of basal implants allow for

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cortical bone and do not require osseointegration unlike conventional implants and hence there is no need for bone grafts in these cases. There are many long term follow up studies (>10 days) since 1976 that have reported its success and high survival. In suitable cases, the immediate placement of the implant and its immediate loading offer several benefits to the patients that include shorter treatment time and significantly reduced time. Since the procedure occurs within a span of 3 days, it can help restore aesthetics immediately and can therefore offer a suitable solution for high patient satisfaction, when clinically indicated. In immediate loading, it excludes the use of bone grafting procedures and complex surgical intervention that may otherwise be required in cases of resorbed ridges. The one-stage technique offers a simplified surgical workflow and requires only one surgery instead of two. The basal implants get their anchorage from the basal bone whereas conventional implants gets their anchorage from the alveolar bone. Since the BCS implants are thin and smooth they are perfect design to perform flapless key hole implant placement (without opening the gum). This is called Minimally Invasive Implant Dentistry or Keyhole dental implants. Moreover, these implants can be placed into fresh extraction sockets even if the extracted tooth was highly decayed and resulted into an abscess or if the tooth was extremely mobile. Immediate implants can also be placed in smokers as well as patients with controlled diabetes. These implants can also be immediately loaded within a period of 3-5 days since they heal in a better way when they are loaded immediately with the close collaboration between an oral surgeon, prosthodontist and lab technician. Types of basal implants:

There exist two types of basal implants, namely BOI (Basal Osseo Integrated) and BCS (Basal Cortical Screw) that are placed into the strong cortical bone, while BCS is screwable with a thread diameter of upto 12mm and is placed into sockets immediately after extraction, BOI is generally inserted into the jaw bone via the lateral aspect. In these implants, the masticatory load transmission is confined to the cortical bone structures and the accompanying horizontal implant segments. Anterior Implants: Owing to the availability of vertical space, the implants used in the anterior region are with two disks that have a diameter of 9 or 10 mm and the crestal disk has a diameter of 7 mm. The crestal and basal plate of multi-disc implants have different functions. The main purpose of the crestal plate is to provide supplementary support to the implant. The emphasis of crestal plate is lost once the basal plate has ossified to full load. The double disks are not inserted due to the lack of sufficient bone as it 16 leads to failure. A single BOI with a diameter of 7 to 9 mm and shafts between 8 to 13.5 mm can be used instead. Posterior Implants: Square shaped basal implants are used in the posterior region that have a disk diameter of 9 to 12 mm or 10 to 14 mm with shafts of 10 to 13.5 mm in length, depending on the available horizontal bone.

BCS: The screw basal implants are flapless implants that are inserted through the gingiva, without giving a single cut, inserted like a conventional implant. Bicortical screws (BCS) are also considered basal implants, as they transmit masticatory loads deep into the bone, usually onto the opposing cortical bone. The screw basal implants provide initially some elasticity and they are not prone to peri-implantitis due to the highly polished surface and thin mucosal penetration diameter. Applications of Basal implants:

Basal implants are versatile and can be used in a variety of applications, including: Full-arch restoration: Basal implants can be used to support a full arch of teeth, either on the upper or lower jaw. This is particularly useful in cases where patients have lost all or most of their teeth. Single-tooth replacement: Basal implants can be used to replace a single missing tooth. This is a good option for patients who cannot have traditional implants due to lack of bone density or volume.

Multiple teeth replacement: Basal implants can be used to replace multiple missing teeth, either with individual implants or with implant-supported bridges.

Immediate loading: Basal implants are designed to allow immediate loading, which means that a crown or bridge can be placed on the implant right after surgery. This can reduce the overall treatment time for patients.

Orthodontic anchorage: Basal implants can be used in orthodontics to anchor braces or other orthodontic appliances.

Overall, basal implants are a reliable and effective solution for patients with limited bone volume or density in the jaw, and they offer a range of applications for different types of dental restorations. However, as with any dental procedure, it is important to consult with a qualified dentist or oral surgeon to determine if basal implants are the right option for your individual needs.

Indications of basal implants:

1. In circumstances when several teeth are missing and there is a need to extract them.

2. When a bone augmentation or bone regneration procedure has failed.

3. Incidences of thin ridges where there is a deficiency of bone in the buccolingual region

4. where bone height is generally not sufficient

Contraindications of Basal Implants:

1. Medical conditions: A recent history of myocardial infarction (heart attack), Cerebrovascular stroke, Immunosuppression would compromise the body and immune system thus precluding the placement of basal implants.

2. Patients who are on anti-cancer medication or on blood clotting medications do not meet the criteria for basal implant placements.

Rationale for using Basal Implants:

Basal implants, also known as basal osseointegrated implants, are a type of dental implant that utilizes the cortical bone as the primary anchorage for support. This type of implant has gained popularity over the past few decades due to its high success rates, minimal invasiveness, and ability to support immediate loading. In this literature review, we will explore the rationale behind using basal implants and the advantages they offer over traditional implant systems. Bone quality and quantity: Basal implants are designed to be placed in the cortical bone, which has higher density and strength compared to the trabecular bone. This allows for immediate loading of the implant, which means that a patient can receive a fixed prosthetic restoration soon after the implant is placed. Additionally, basal implants can be used in cases where there is insufficient bone volume, such as in cases of severe resorption or in patients with a history of failed implant treatments (17,18,33). Reduced invasiveness: Basal implants are typically placed using a minimally invasive approach, which involves a small incision and minimal bone removal. This reduces postoperative pain, swelling, and the risk of complications associated with traditional implant surgery. High success rates: Basal implants have been shown to have high survival rates and low complication rates. A systematic review and meta-analysis of 17 studies involving 1163 patients showed a cumulative survival rate of 96.3% after 5 years and 91.1% after 10 years. Immediate loading: Basal implants are designed to support immediate loading, which means that a patient can receive a fixed prosthetic restoration soon after the implant is placed. This eliminates the need for a temporary restoration and reduces the treatment time(34,35,36). Cost-effective: Basal implants can be a cost-effective alternative to traditional implant systems, especially in cases where multiple implants are needed. In conclusion, basal implants offer several advantages over traditional implant systems, including reduced invasiveness, high success rates, and the ability to support immediate loading. They can be a viable treatment option for patients with insufficient bone volume or those who require

immediate stability and anchorage in cortical bone. The one-stage surgical technique, immediate loading, and prosthetic options of basal implants allow for reduced treatment time and cost for patients. The early clinical outcomes of basal implants are promising, and more long-term studies are needed to evaluate the clinical outcomes and effectiveness of basal implants.

Replacement of the lost tooth post extraction is important in order to restore chewing ability, function and aesthetics. Moreover, it also affects the psychological and self-esteem of a person. Furthermore, the bone in the extracted socket begins to resorb post extraction in the event that the missing tooth is not replaced. Hence, the prevention of bone loss can be achieved via the placement of dental implants.

Placing conventional implants implies that the procedure can last anywhere between three to twelve months along with several appointments with the dentist in order to complete the entire process. Yet, when appropriate, immediate implants can help shorten the total treatment period and reduce the overall number of visits thus benefitting the patient. Immediate implant placement and immediate loading is when an implant is placed at the same time as the natural tooth is extracted, thus resulting in a single visit appointment where the extraction and implant placement is done at the same time hence resulting in the reduced inconvenience towards the patient. Immediate implants was introduced with the concept of seeking to assist patients who want to be treated in an efficient and expedient manner. Patients who when seeking a solution, prefer a safe and effective treatment that can be performed in the shortest possible time and with as little pain and discomfort as possible. These implants engage mechanically into the

multiple implants. However, proper patient selection, implant placement, and follow-up care are crucial for long-term success.

Advantages of Basal Implants

1. One piece implant – Basal implants are generally a single-piece implant which ensures the minimization of the failure of the implant due to interface problems between the connections that exist in conventional two and three piece implants.

2. Basal cortical bone – These implants acquire support from the basal bone which is generally more resistant to resorption unlike the crestal bone, where the conventional implants are anchored. Besides, cortical bone has a greater regenerative capacity when compared to the crestal bone and hence can be of value in compromising conditions.

3. Additional surgeries: Since basal implants are anchored in the basal bone and not in the crestal bone, there precludes the need for additional surgery such as Bone augmentation / grafting, sinus lifting and nerve transpositioning procedures. On the other hand, in conventional implants, it requires the use of sinus life, soft or hard tissue guided regenerative procedures and second surgery for implants.

4. Implant load distribution: Implant load is safely transmitted to the free basal bone, while in conventional root form, there is a risk for bacterial attack.

5. Peri-implantitis: There is negligible risk for peri-implantitis or peri-implant disease because of the polished surfaces in basal implants.

6. Loading protocol: Immediate loading can be performed in a basal implant. There is no edentulous phase and no need for immediate dentures.

7. Reduced appointments: Extraction and implant placement can be simultaneously done in a single appointment, even if there was a previous or current periodontal disease.

8. Better distribution of masticatory forces: The basal implants are imbedded in high quality basal bone. Hence, the masticatory forces get distributed to the cortical bone areas that are highly resistant to resorption and have a very high repairing capacity.

9. Medically compromised situations – Basal implants work well in controlled diabetics, in smokers and patients suffering from chronic periodontitis.

Disadvantages of Basal implants:

1. It is always advisable to keep a few more extra implants handy to avoid extensive planning including three dimensional exploration of bone conditions.

2. The technique is pretty complex and it poses substantial challenges, for instructors and users alike, as far as the surgical and prosthetic treatment stages substantial knowledge requirements in the fields of biomechanics and bone physiology are concerned.

Complication Of Basal Implants:

Functional overload osteolysis: Masticatory forces transmitted through the basal implants may create local microcracks in the cortical bone. These microcracks are repaired by formation of secondary osteotomes, a process called as remodelling. However, this temporarily reduces the degree of mineralization and increases the porosity of the affected bone. Hence, basal implants have a good chance of reintegration, if loads are reduced to an adequate amount.

Table 1

Indications and contraindications of basal implants:		
Indications	Contraindications	
1. when several teeth are missing or extraction of several teeth have been indicated	1. Medical related diseases/ conditions: Several diseases and conditions prevent the use of implants that are not limited to a myocardial infarction (heart attack) or cerebrovascular accident (stroke), immunosuppression (a reduction in the efficacy of the immune system)	
2. When two-stage implant placement process or bone augmentation has failed or not demonstrated expected results	 Medications: Certain drugs or medications such anti-cancer drugs, blodd thinners and bisphosphonates like alendronate, zolendronate that are administered for the treatment of osteopororsis preclude the use of dental implants. 	
3. Bone atrophy i.e. in case of knife edged, thin ridges, insufficient bucco- lingual thickness or insufficient bone height		

Table 2. Comparison between basal and conventional implants:

Category	Basal Implant	Conventional Implant
Indications	Can be placed in extraction sockets immediately for multiple unit restorations	Ideally placed in single or multiple-unit restorations only in regions where there is adequate bone height
Loading	Can be immediately loaded within 72 hours	Delayed loading between 3-6 months
Corticalization	Corticalization is precluded in these procedures owing to the established of primary stability because these thin screw implants possess a cortical anchorage thus disseminating the forces along the vertical surface of the basal implants.	A bone-hard tissue interface is created between the implant and the bone ,excluding the presence of the soft tissue
Surgery	These procedures are generally flapless and are more time-efficient as compared to bridgework.	These procedures are generally more complicated and often require 3-4 sittings over an extensive period of 3-6 months.
Cost	These procedures are generally reasonable in comparison to the efforts rendered during the process	These procedures are generally expensive, and the cost can increase if bone grafts or sinus lift surgeries are advised.
militani pieces	Single-piece strength provided by implant is excellent	Two-piece some time the relation between them make the problem
Criteria	There is no criteria required for placement of the basal implants and it can be placed	Adequate bone, good physical health is required for conventional implants placement.
Design	Wide range of designs are available	Limited range of designs are only available
Bone quality	Basal implants are inserted into the basal bone and this bone is supposed to be highly mineralized, greatly dense and has a lower inclination towards bone resorption.	Conventional implants are placed into the crestal alveolar bone whose bone quality is poor and is more inclined towards resorption.
Sinus lift	These procedures do not require an additional sinus-lift surgery	If conventional implants have to be placed in the atrophic posterior maxilla, then simus-lift surgeries maybe indicated.
Implant strength	Basal implants derive their strength from single-piece implants.	Conventional implants are made up of two-piece implants and often-times the relation between them create the problem
Impressions	These procedures are non-complex and employ the use of conventional impressions of the implants that can be made with routine bridgework procedures.	These procedures require different type of impressions (open tray, closed tray etc) and involve generally increased chair time.

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In recent years, there have been several advances in basal implantology that have improved the success rates and outcomes of implant placement surgeries. Some of these advances include: Design improvements: Basal implants have been redesigned to optimize their stability and ensure a high success rate. These implants are typically made from high-quality materials like titanium or zirconia and feature advanced surface treatments to enhance osseointegration. Computer-guided implant placement: Computer-guided implant placement involves using 3D imaging and virtual planning software to precisely plan and place implants in the optimal location. This approach can improve accuracy, reduce complications, and result in faster healing times.

Flapless surgery: Flapless surgery involves making a small incision in the gum tissue without the need for a full flap, which can reduce the risk of complications and promote faster healing. Immediate loading: Basal implants are designed to be immediately functional, meaning that a fixed bridge or denture can be placed on the same day as the implant placement surgery. This can improve patient satisfaction and reduce the overall treatment time.

Minimally invasive surgery: Minimally invasive surgery involves using smaller incisions and less invasive techniques to place implants. This approach can reduce discomfort, swelling, and healing time for patients.

Bone graft-free implant placement: Basal implants can often be placed without the need for bone grafting, which can reduce the overall cost and complexity of the implant placement procedure. II. Summary:

Basal implants are a type of dental implant that has been developed to address the challenges of conventional implants in patients with poor bone quality or quantity. Basal implants have been gaining popularity due to their unique design, surgical technique and high success rate. In this literature review, we will discuss the characteristics, indications, surgical technique, prosthetic options, and clinical outcomes of basal implants.

Characteristics of basal implants:

Basal implants have a wider base and a tapered design compared to conventional implants. They are made of biocompatible materials such as titanium, zirconia or ceramic. Basal implants are designed to achieve immediate stability and anchorage in cortical bone, which allows for immediate loading and osseointegration.

Indications for basal implants:

Basal implants are indicated for patients with poor bone quality or quantity, systemic diseases, atrophy of the jawbone, or those who have failed previous implant treatments. They are also indicated for patients who need immediate restoration and cannot wait for the conventional implant healing period.

Surgical technique for basal implants:

The surgical technique for basal implants is different from conventional implants. It is a one-stage surgical technique that involves placing the implant directly into the basal bone with minimal bone preparation. The implant is placed in a way that it is in contact with the cortical bone, which provides stability and anchorage. The implant can be loaded immediately after placement, which allows for immediate function and osseointegration.

Prosthetic options for basal implants:

Basal implants are designed primarily for full arch restorations. The prosthetic options include fixed prostheses such as bridges, hybrid prostheses, or removable prostheses such as overdentures. The prostheses can be supported by as few as four implants, which reduces the treatment time and cost for patients.

Clinical outcomes of basal implants:

Studies have shown that basal implants have high success rates ranging from 92-98%. The immediate loading and osseointegration of basal implants have been shown to reduce treatment time and cost for patients. Basal implants have also been shown to have a lower incidence of periimplantitis and bone loss compared to conventional implants. In conclusion, basal implants offer a viable option for patients with poor bone quality or quantity, systemic diseases, or those who have failed previous implant treatments. The unique design, surgical technique, and prosthetic options of basal implants allow for immediate function, osseointegration, and reduced treatment time and cost. While more long-term studies are needed to evaluate the clinical outcomes of basal implants, the early results are promising and suggest that basal implants have the potential to revolutionize implant dentistry.

Future directions:

Basal implants are implanted in a different way as compared to conventional implants, hence the pain associated with it is minor or negligible. The amount of swelling may vary from patient to patient. Since these implants are placed flapless and do not require any bone grafting or additional surgeries, the discomfort associated with it is very negligible. The surgery is done under local anesthesia, that is why during the implantation of implant the patient feels nothing, and as the tissues are not practically traumatized, the rehabilitation period passes quite easily and without pain. The atrophied maxilla and mandible pose a concern for the placement of conventional implants owing to the need for bone grafting procedures, additional surgery and overall increased costs. With a view towards addressing these drawbacks, the concept of basal implants was introduced. These implants are anchored into the basal bone and hence mechanically engage into the bone. These implants have also reported success in patients with periodontal disease, smokers and in diabetics. They do not required additional procedures like bone grafting thus decreasing associated expenses and making it a very feasible option presently. However, current literature lacks adequate long term studies that reports of the bone changes associated with these implants, hence future studies can be directed towards analyzing and observing the changes around the bone structure and volume surrounding these implants.

References:

[1]. Abi Najm S, Malis D, El Hage M, Rahban S, Carrel JP, Bernard JP. Potential adverse events of endosseous dental implants penetrating the maxillary sinus: the long-term clinical evaluation. The Laryngoscope. 2013;123(12):2958-61.

[2]. Henry PJ. Tooth loss and implant replacement. Australian dental journal. 2000;45(3):150-72. [3]. Bocklage R. Advanced alveolar crest atrophy: an alternative treatment technique for maxilla and mandible. Implant dentistry. 2001;10(1):30-5.

[4]. Zhong W, Chen B, Liang X, Ma G. Experimental study on the penetration of dental implants into the maxillary sinus in different depths. Journal of applied oral science: Revista FOB. 2013;21(6):560-6.

[5]. Galindo-Moreno P, Padial-Molina M, Avila G, Rios HF, HernandezCortes P, Wang HL. Complications associated with implant migration into the maxillary sinus cavity. Clinical oral implants research. 2012;23(10):1152-60.

[6]. Nolan PJ, Freeman K, Kraut RA. Correlation between Schneiderian membrane perforation and sinus lift graft outcome: a retrospective evaluation of 359 augmented sinus. Journal of oral and maxillofacial surgery: official journal of the American Association of Oral and Maxillofacial Surgeons. 2014;72(1):47-52.

[7]. Barone A, Santini S, Sbordone L, Crespi R, Covani U. A clinical study of the outcomes and complications associated with maxillary sinus augmentation. The International journal of oral & maxillofacial implants. 2006;21(1):81-5.

[8]. Shlomi B, Horowitz I, Kahn A, Dobriyan A, Chaushu G. The effect of sinus membrane perforation and repair with Lambone on the outcome of maxillary sinus floor augmentation: a

dentistry. 2008;17(2):159-68.

2004;19(4):559-62.

radiographic assessment. The International journal of oral & maxillofacial implants. [9]. Misch K, Wang HL. Implant surgery complications: etiology and treatment. Implant [10]. Proussaefs P, Lozada J, Kim J, Rohrer MD. Repair of the perforated sinus membrane with

3.

a resorbable collagen membrane: a human study. The International journal of oral & maxillofacial implants. 2004;19(3):413-20.

[11]. Farhat FF, Kinaia B, Gross HB. Sinus bone augmentation: a review of the common techniques. Compendium of continuing education in dentistry. 2008;29(7):388-92, 94-7; quiz

[12]. Anavi Y, Allon DM, Avishai G, Calderon S. Complications of maxillary sinus augmentations in a selective series of patients. Oral surgery, oral medicine, oral pathology, oral radiology, and endodontics. 2008;106(1):34-8.

[13]. Misch CE, Perel ML, Wang HL, Sammartino G, Galindo-Moreno P, Trisi P, et al. Implant success, survival, and failure: the International Congress of Oral Implantologists (ICOI) Pisa Consensus Conference. Implant dentistry. 2008;17(1):5-15.

[14]. Cranio-maxillofacial Implant Directions® Vol. 7 N 4 December 2012 English Edition.Case Report-Equipping the upper jaw with basal screw implants to treat a case with severe bone loss and after the failure of an "all-on-four"-type construction.

[15]. Basal implants : Review article- An Alternative to Conventional Dental Implants: Basal Implants. Yadav RS, Sangur R, Mahajan T, Rajanikant AV, Singh N, Singh R (Rama Univ J Dent Sci 2015 June;2(2):22-28)

[16]. Kline R, Hoar JE, Beck GH, Hazen R, Resnik RR, Crawford EA. A prospective multicenter clinical investigation of a bone quality-based dental implant system. Implant dentistry. 2002;11(3):224-34.

[17]. Ihde S. (Edt.) Principles of BOI: Clinical, Scientific and Practical Guidelines to 4-D Dental Implantology. 1st ed: Springer 2005.

[18]. Ihde S, Ihde A. Immediate Loading Guideline to successful implantology. Munich, Germany: International Implant Foundation Publishing;2010.

[19]. Kopp S, Bienengräber V, Ihde S Basal implants as a solid base for immediately loaded full arch bridges. Dental Forum 2009:52-60

[20]. Khairnar M, Gaur V. Evidence of bone formation in the nasal floor around polished surface bi-cortical screw implants after indirect nasal lift in an atrophied maxilla: Cone beam computed tomography-based case report. J Indian Soc Periodontol 2015; 19:236-8

[21]. Jung JH, Choi BH, Zhu SJ, Lee SH, Huh JY, You TM, et al. The effects of exposing dental implants to the maxillary sinus cavity on sinus complications. Oral surgery, oral medicine, oral pathology, oral radiology, and enendodontics. 2006;102(5):602-5.

[22]. Tabrizi R, Amid R, Taha Ozkan B, Khorshidi H, Langner NJ. Effects of exposing dental implant to the maxillary sinus cavity. The Journal of craniofacial surgery. 2012;23(3):767-9. [23]. Chrcanovic BR, Abreu MH. Survival and complications of zygomatic implants: a systematic review. Oral and maxillofacial surgery. 2013;17(2):81-93.

[24]. Jung JH, Choi BH, Jeong SM, Li J, Lee SH, Lee HJ. A retrospective study of the effects on sinus complications of exposing dental implants to the maxillary sinus cavity. Oral surgery, oral medicine, oral pathology, oral radiology, and endodontics.

2007;103(5):623-5.

[25]. Hong YH, Mun SK. A case of massive maxillary sinus bleeding after dental implant. International Journal of oral and maxillofacial surgery. 2011;40(7):758-60.

[26]. Hunter WL, Bradrick JP, Houser SM, Patel JB, Sawady J. Maxillary sinusitis resulting from ostium plugging by dislodged bone graft: a case report. Journal of oral and maxillofacial surgery: official journal of the American Association of Oral and Maxillofacial Surgeons. 2009;67(7):1495-8

[27]. Yadav RS, Sangur R, Mahajan T, Rajanikant AV, Singh N, Singh R. An alternative to conventional dental implants: Basal implants. Rama Univ J Dent Sci. 2015;2:22–8. [28]. Gupta A, Madan B, Bakshi M, Garg M. Full mouth rehabilitation with immediate loading basal implants. Int J Prev Clin Dent Res. 2017;4:159-61

[29]. Oleg D, Alexander L, Konstantinovic Vitomir S, Olga S, Damir S, Biljana M. Immediatefunctional loading concept with one-piece implants (Beces/Beces N/Kos/Boi) in the mandible and maxilla – A multi-center retrospective clinical study. J Evol Med Dent Sci. 2019;8:306–15.

[30]. Gupta AD, Verma A, Dubey T, Thakur S. Basal osseointegrated implants: Classification and review. Int J Contemp Med Res. 2017;4:2329-35.

[31]. Frost HM. Wolff's Law and bone's structural adaptations to mechanical usage: An overview for clinicians. Angle

Orthod. 1994;64:175-88

[32]. Iezzi G, Pecora G, Scarano A, Perrotti V, Piattelli A. Immediately loaded screw implant retrieved after a 12-year loading period: A histologic and histomorphometric case report. J Osseointegration. 2009;2009:54-9.

[33]. Gaur V, Doshi A, Ihde S, Fernandes G. Immediate loading of edentulous mandibular arch with screw retained final prosthesis on strategic implants® with single piece multi unit abutment heads: A case report. BAOJ Dent. 2018;4:042.

[34]. Ihde S, Ihde A. Cookbook Mastication. Munich: Internat. Implant Foundation; 2015.

[35]. Shahed SS, Nagaral SC, Mujawar AM. Basal implants: A breakthrough for atrophic ridges: Review. J Appl Dent Med Sci. 2018:4:53.

[36]. Patel K, Madan S, Mehta D, Shah SP, Trivedi V, Seta H. Basal Implants: An Asset for Rehabilitation of Atrophied Resorbed Maxillary and Mandibular Jaw - A Prospective Study. Ann Maxillofac Surg. 2021 Jan-Jun;11(1):64-69. doi:

10.4103/ams.ams 446 20. Epub 2021 Jul 24. PMID: 34522656: PMCID: PMC8407620.

Join hands with Simpladent and be the leader in your area with flourishing practice.

There are several potential benefits for other dental surgeons to tie up with Simpladent Implant Clinics, especially if they are interested in offering corticobasal immediate loading dental implants in India. Here are some of the key advantages they can expect:

Referral Network: 1.

For dentists who are not currently providing implant services, collaborating with Simpladent provides an opportunity to refer their patients to a trusted and experienced implantology center. This enhances their reputation as they can offer comprehensive dental care to their patients.

2. **Expanded Services:**

Dentists who are primarily focused on traditional implants can expand their service offerings by inviting Simpladent to provide immediate loading implants. This allows them to meet the increasing demand for advanced implant techniques and gain a competitive edge in the market

Access to Expertise:

Dentists can tap into Simpladent's extensive expertise in corticobasal immediate loading dental implants. This collaboration allows them to benefit from the knowledge and experience of TOP Implantologists, enhancing their own professional skills and confidence.

Increased Patient Satisfaction: 4.

Immediate loading dental implants offer the advantage of reduced treatment times, quicker healing, and improved patient comfort. This results in higher patient satisfaction and, in turn, greater loyalty and referrals to the collaborating dentists.

5. Implant Failure Cases:

Dentists encountering implant failure cases can turn to Simpladent for consultation or revision surgeries. This can help salvage difficult cases, minimize patient distress, and maintain their patient base.

Diploma Programs: 6.

Dentists can enroll in Simpladent's internationally accredited diploma programs to acquire the advanced and latest skills and knowledge to offer immediate loading dental implants in their own practice. This investment in education can help them broaden their services and reach a larger patient population.

7. Franchise Opportunities:

By collaborating with Simpladent, dentists can explore the possibility of becoming franchisees. This allows them to leverage the brand's reputation and established systems while providing immediate loading dental implants under the Simpladent banner.

8. Trust and Mutual Benefits:

Simpladent emphasizes building trust and maintaining a mutually beneficial relationship with collaborating dentists. This ensures that the interests of both parties are safeguarded. Dentists can feel confident that the collaboration will not harm their practice and that they are working with a reputable and ethical partner.

9. International Referrals:

Simpladent's ability to attract patients from all over the world can benefit collaborating dentists by connecting them with international patients who seek dental services in the Delhi NCR region.

In summary, collaborating with Simpladent Implant Clinic offers other dental surgeons access to advanced implant techniques, education, and opportunities for professional growth. It can enhance their reputation, expand their service offerings, and ultimately lead to improved patient satisfaction and practice success. The key to a successful partnership is building trust and ensuring that the arrangement is mutually beneficial. For franchising opportunity, visit www.simpladent.in

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Looking For World Class Dental Implant Quality with Affordability, Visit Simpladent Clinics in India & get your smile back in 48 hours says Mr Anuj Gaur, Director Simpladent

Tete-e-tete with Mr Anuj Gaur, Director-Simpladent India

Dr NK: Welcome Mr Anuj and thank you for your valuable time. Today I am going to ask you some questions on behalf of Dental tourists from all over the world addressing their basic concerns and queries. Can you provide an overview of Simpladent's Dental Tourism Division and what sets it apart from other dental tourism options in Delhi NCR?

AG: Certainly, Simpladent's Dental Tourism Division is a dedicated branch of our dental implant clinics that caters specifically to international patients seeking high-quality dental care in Delhi NCR. What sets Simpladent apart from other dental tourism options in the region is our unwavering commitment to delivering exceptional dental services with a strong focus on patient comfort and satisfaction.

Highly Specialized Expertise: One of our key strengths lies in our team of highly skilled dental professionals and specialists who have extensive experience in immediate loading dental implants. We pride ourselves on our expertise in this field, which allows us to offer cutting-edge dental solutions to our international patients. Our chief implantologis, Dr Vivek Gaur is of international repute and is mentor of doctors from all over the world. He has almost two decades of experience in dental implants.

Advanced Technology: Simpladent is equipped with state-of-the-art dental technology and equipment. We continuously invest in the latest innovations to ensure that our patients receive the best possible treatment outcomes. This commitment to technology sets us apart by enabling us to provide efficient and precise care. Dental implants takes repeated dental visits and months of treatment but OUR IMMEDIATE LOADING CORTICOBASAL IMPLANT TECHNOLOGY TAKES JUST 48 HOURS TO FIX YOUR TEETH. This is not only an advance technology but technically superior from traditional implants.

Safety and Hygiene: We understand the importance of maintaining the highest standards of safety and hygiene, especially in the post-pandemic world. Our clinics adhere to strict infection control protocols to ensure the safety and well-being of our patients throughout their treatment journey.

Patient-Centered Approach: At Simpladent, we prioritize the needs and preferences of our international patients. Our Dental Tourism Division is designed to provide a seamless and stress-free experience, from initial contact through treatment and post-care support. We offer personalized treatment plans tailored to each patient's unique requirements.

Cost-Effective Solutions: We recognize that affordability is a crucial consideration for dental tourists. Simpladent is committed to offering competitive pricing without compromising on the quality of care. We ensure that our international patients receive excellent value for their investment.

Comprehensive Services: Our Dental Tourism Division provides a wide range of dental procedures, including implant placement, restorative work, and cosmetic dentistry. This comprehensive approach allows us to address all aspects of a patient's dental health in a single location.

Transparent Communication: Clear and open communication is at the core of our patientcentered approach. We ensure that international patients have a full understanding of their treatment options, costs, and expected outcomes. We also provide detailed post-treatment instructions and ongoing support.

International Accessibility: Simpladent assists international patients with travel logistics, including accommodation and transportation. Our convenient location in Delhi NCR makes it accessible for patients arriving from various parts of the world.

In summary, Simpladent's Dental Tourism Division is distinguished by its unwavering commitment to excellence, a patient-centric approach, advanced technology, and a team of highly skilled professionals. We aim to provide international patients with a hassle-free and rewarding dental tourism experience in Delhi NCR. Choosing Simpladent means gaining access to a leading dental implant center with a strong emphasis on innovation, technology, and patient-centered care. We are dedicated to providing international patients with cutting-edge dental solutions that deliver outstanding results and an overall positive treatment experience. And I am always proud to say that WE RECEIVE PATIENTS FROM ALL OVER THE WORLD BE IT US, EUROPE, ASIA, SOUTH ASIA, AFRICA OR OTHERS.

Dr NK: Accessibility and convenience are crucial for dental tourists. How does Simpladent assist patients with travel logistics, including accommodation and transportation?

AG: At Simpladent Immediate Loading Dental Implant Clinics, we understand that accessibility and convenience are paramount for dental tourists. We have established a range of services to assist our international patients with travel logistics, including accommodation and transportation:

Medical and Travel Insurance Guidance: We can provide information and guidance on medical and travel insurance options, helping you make informed decisions about your coverage while in India. Flexible Scheduling: We understand that travel plans may change. Simpladent offers flexibility in scheduling appointments, allowing you to adjust your treatment plan as needed to accommodate your travel itinerary.

travel itinerary. Post-Treatment Care: After your dental procedures, we provide guidance on posttreatment care and follow-up appointments, ensuring that you receive appropriate care even after returning home. Our commitment to providing comprehensive support and assistance to our international patients goes beyond dental treatment. We want you to feel comfortable and confident throughout your



dental journey with Simpladent. Our team is dedicated to ensuring that your travel logistics are well-managed, allowing you to focus on your dental care and enjoy your time in Delhi NCR to the fullest.

Dr NK: Dental tourism often involves multiple appointments. How does Simpladent streamline treatment plans with 48 hour immediate loading dental implant services to ensure efficiency and minimize patients' time away from home?

AG: Simpladent is committed to streamlining treatment plans for dental tourists, particularly with our 48-hour immediate loading dental implant services. We understand the importance of efficiency and minimizing the time patients spend away from home. Here's how we achieve this: Comprehensive Consultation: Before your arrival, we conduct a thorough consultation, often remotely through telemedicine, to assess your dental needs and develop a preliminary treatment plan. This minimizes the time spent on initial assessments during your visit.

Customized Treatment Plan: We create a customized treatment plan tailored to your specific needs and goals. This plan outlines the procedures and appointments required, optimizing your time in India.

Pre-Treatment Planning: Prior to your arrival, our team begins pre-treatment planning, which includes ordering any necessary dental materials, implants, and prosthetics. This ensures that everything is ready for your treatment upon arrival.

Fast-Track Immediate Loading Implants: Simpladent specializes in immediate loading dental implants. This means that during your first appointment, dental implants are placed, and prosthetics are attached within 48 hours, providing you with functional teeth shortly after your arrival. Efficient Chair Time: Our highly skilled dental professionals are experts in immediate loading implant techniques. Their expertise ensures efficient chair time, minimizing the time you spend in the dental chair while maintaining the highest standard of care.

State-of-the-Art Technology: We utilize advanced dental technology, such as computer-guided implant placement and digital impressions, to enhance precision and reduce treatment time. Team Collaboration: Our multidisciplinary team of dental specialists collaborates closely to coordinate your treatment plan, ensuring seamless transitions between procedures and appointments.

Post-Operative Monitoring: After your initial procedures, we provide post-operative monitoring and

Airport Transfers: We arrange airport transfers to ensure a smooth and hassle-free arrival for our patients. Our team will be waiting to greet you at the airport and transport you to your accommodation or the clinic.

Accommodation Assistance: Simpladent can assist in booking accommodation for international patients. We have partnerships with local hotels and serviced apartments, offering a range of options to suit different preferences and budgets.

Transportation to the Clinic: We provide transportation to and from the clinic for your appointments. Our goal is to make sure you arrive at your dental treatments comfortably and on time.

Local Transportation Guidance: Our staff can provide information and assistance with local transportation options, including taxis, ride-sharing services, and public transportation, helping you navigate Delhi NCR with ease.

Travel and Tourist Information: Simpladent's Dental Tourism Division can provide

information about local attractions, cultural experiences, and tourist destinations. We want you to make the most of your visit to India.

Interpreter Services: If language is a barrier, we can arrange for interpreter services to ensure clear communication between you and our dental team. We aim to make your experience as smooth as possible.

Concierge Services: Our Dental Tourism Division offers concierge services to address any special requests or needs you may have during your stay, ensuring a comfortable and enjoyable visit to Delhi NCR.

support to ensure that your recovery is progressing as expected.

Follow-Up Care: Simpladent offers follow-up appointments and post-treatment care guidelines, both in person and remotely, to monitor your progress and address any concerns after you return home.

Treatment Guarantees: We stand behind the quality of our work and offer treatment guarantees. In the rare event of an issue, we provide necessary corrections or replacements, reducing the need for additional visits.

By combining immediate loading dental implants, efficient treatment protocols, advanced technology, and a patient-centric approach, Simpladent minimizes the number of appointments required for dental tourists. This approach allows you to receive high-quality dental care while spending less time away from home, making your dental tourism experience convenient, efficient, and patient-focused.

Dr NK: Can you discuss the qualifications and expertise of your dental professionals and specialists, reassuring patients of the quality of care they'll receive?

AG: Certainly, at Simpladent Immediate Loading Dental Implant Clinics, we take great pride in the qualifications and expertise of our dental professionals and specialists. We understand the importance of assuring patients of the quality of care they will receive. Our Chief Implantologist Dr Vivek Gaur has over two decades of experience. Here's an overview of our team's qualifications and expertise:

Highly Qualified Dentists: Our dental team includes highly qualified and experienced dentists who have completed their dental education and training from reputable institutions. They hold degrees in dentistry and are licensed to practice in India.

Specialization in Implant Dentistry: All our dental surgeons have undergone advanced training and specialization in implant dentistry. They have acquired expertise in immediate loading dental implants and related procedures.

Continuous Education: Our dental professionals are committed to ongoing education and training to stay updated on the latest advancements in dental technology and techniques. This commitment ensures that our patients receive the most current and effective treatments available.

Advanced Technology: Our team is proficient in utilizing advanced dental technology and equipment, including digital imaging, 3D planning software, and CAD/CAM systems, to enhance the precision and efficiency of treatments.

Safety and Hygiene: Our dental professionals are well-versed in maintaining rigorous safety and hygiene protocols, adhering to international standards to ensure the safety and well-being of our patients.

Patient-Centric Care: Above all, our dental professionals are dedicated to providing patientcentric care. They listen to patients' concerns, answer questions, and involve patients in treatment decisions to ensure that each patient's unique needs are met.

We take pride in the qualifications and expertise of our dental team and their commitment to delivering high-quality dental care. Patients can trust that they are in capable hands at Simpladent Immediate Loading Dental Implant Clinics, where their oral health and overall well-being are our top priorities. Anyone can excess further details at our site simpladentclinics.com

Dr NK: What post-treatment support and follow-up care does Simpladent offer to international patients, even after they return to their home countries?

AG: Simpladent understands the importance of post-treatment support and follow-up care for international patients, even after they return to their home countries. Our commitment to patient care extends well beyond the completion of dental procedures. Here's an overview of the post-treatment support and follow-up care we offer:

Detailed Post-Treatment Instructions: Before you leave our clinic, we provide you with detailed post-treatment care instructions. These guidelines are tailored to your specific procedure and are designed to help you manage your recovery and maintain oral health. Remote Consultations: We offer remote consultations via telemedicine or video conferencing platforms to check on your progress and address any concerns or questions you may have after returning home. This allows us to provide ongoing support and guidance.

Treatment Guarantees: Simpladent stands behind the quality of our work and offers treatment guarantees. In the rare event of an issue with your dental implants or prosthetics, we provide necessary corrections or replacements at no additional cost to you.

24/7 Support: Simpladent's Dental Tourism Division provides round-the-clock support to assist you with any emergencies or concerns that may arise. We are just a phone call or email away, ready to help you when needed.

Communication Channels: We maintain open communication channels with our international patients, allowing you to reach out to us with any questions or issues you may encounter after returning home.

Our goal is to provide ongoing support and care to international patients, regardless of their location. We want to ensure that you continue to experience the benefits of your dental treatment and maintain optimal oral health long after your visit to Simpladent Immediate Loading Dental Implant Clinics. Your well-being and satisfaction remain our top priorities.

Dr NK: Finally, what message would you like to convey to potential international patients who are considering Simpladent for their dental care needs in India?

AG: At Simpladent Immediate Loading Dental Implant Clinics, your dental health and overall well-being are our top priorities. We understand that choosing dental care abroad is a significant decision, and we are here to provide you with a world-class dental experience that is efficient, safe, and tailored to your unique needs.

Our commitment to you includes:

Quality Care: We pride ourselves on offering high-quality dental care delivered by a team of skilled professionals who are experts in their respective fields.

Innovation: We utilize cutting-edge technology and innovative treatment approaches to ensure you receive the most advanced and effective dental solutions available.

Efficiency: We understand the value of your time. Our immediate loading dental implant techniques and streamlined treatment plans minimize the time you spend away from home. Safety: Your safety is paramount. We maintain rigorous hygiene and infection control protocols to ensure a safe and sterile environment for your dental procedures.

Transparency: We believe in transparent communication and clear pricing structures, so you can make informed decisions about your dental care.

Patient-Centered Approach: Your comfort, satisfaction, and well-being are at the heart of everything we do. We listen to your concerns, answer your questions, and tailor your treatment to your individual needs.

Ongoing Support: Our commitment to you extends beyond your visit. We offer treatment guarantees and ongoing support to ensure your long-term oral health and peace of mind. Cultural Sensitivity: We understand and respect the diverse backgrounds and preferences of our international patients, ensuring you feel comfortable and valued throughout your journey. Travel Assistance: We provide comprehensive travel logistics support to make your visit to Delhi NCR as convenient and enjoyable as possible. Dental Tourism Experience: We collaborate with local partners to offer a holistic dental tourism experience that allows you to explore the rich culture and attractions of Delhi NCR. We invite you to experience the excellence of Simpladent and trust us with your dental care needs. We are dedicated to helping you achieve a healthy, beautiful smile while ensuring your overall well-being throughout your dental journey. Simpladent is more than a dental clinic; it's your partner in oral health and a bridge to a brighter, more confident future. We look forward to welcoming you to our clinics and assisting you in your pursuit of optimal dental health. Warm regards, The Simpladent Team

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Considerations Regarding Treatment Options and Technique For Cortically Anchored Implants in the Distal Maxilla

Abstract: Dental implantology has made possible the replacement and restoration of function, aesthetics and phonetics in the lost dentition. And although, new research in the field of dental implantology and osseointegration has surpassed various expectations, restoration of the resorbing maxilla has always posed a problem to the practicing dentist. The distal segment of the upper jaw appears especially prone to the effects of aging and it suffers early from deterioration due to various reasons. Implant rehabilitation has demonstrated high success rates of 84–92 %, when sufficient bone is available in maxilla. However, atrophy in maxilla is not an uncommon finding and conventional implant placement in this region can often be challenging. In this review, we discuss the various obstacles in the path towards restoring the atrophic maxilla as well as surgical, prosthetic and other implant techniques imperative towards a successful outcome. Keywords:Strategic Implant®, posterior maxilla, pterygoid implants, cortically anchored implants.

I. Introduction

It has been reported that the stomatognathic system demonstrates accelerated ageing in comparison to the remainder systems in the body, owing to the fact that an individual loses all or most of his teeth long before he can lose his life1. Hence, Modern dentistry is aimed towards restoring the normal contour, function, comfort esthetics, speech, and health regardless of the atrophy, disease, or injury of the stomatognathic system1. However, conventional methods and techniques in dentistry are incompetent with regard to meeting these goals. With a view towards addressing this concern, dental implantology was introduced1. Dental implantology is a term used today to describe anchoring of alloplastic material into the jaws to provide support and retention for prosthetic replacement of teeth that has been lost. Furthermore, advances in the field of implantology have resulted in the implementation of novel implant materials, designs and techniques that are now available for use in rehabilitation of different clinical problems1. The increased need and use of implantrelated treatments result from the combined effect of a number of factors including psychological aspects of tooth loss, aging population, tooth loss related to age, anatomic consequences of edentulism, poor performance of removable prosthesis, and predictable longterm results of implant-supported prostheses. In the severely atrophic maxilla, factors such asmaxillary sinus pneumatization, the resorption of the alveolar ridge, presence of nasal cavities, and type 3 or 4 bone quality reduces the success rate of conventional dental implant2, 3.Hence, several treatment options have been proposed to solve this situation, including bone grafting techniques-block bone grafts and sinus lifting via crestal or lateral approach-and nongrafting techniques, which are modifications of the conventional implant procedure, such as placement in the zygomatic bone, the pterygoid process or the maxillary tuberosity, and use of short or tilted implants. In this paper, we discuss the considerations for the treatment options and techniques for cortically anchored implants in the distal maxilla Bone density considerations for implant placement:

Len Tolstunov4, 5 divided maxilla and mandible into two zones, each depending upon the prognosis of the survival of the implants. According to his classification, Zone 1 in the Maxilla includes the area between 1st premolar - 1st premolar (-traumatic zonel or -premaxilla —) and Zone 2 (—sinus zonel) represents the area extending from the 2nd premolar distally until the end of the maxilla. Likewise the mandible is also divided into two zones: i.e. the inter-foraminal region (Zone 3) that demonstrates (for conventional 2-stageimplants) higher implant survival rates compared to the area of the premolars and molars (Zone 4). The distal or posterior segments of maxilla and mandible that are considered as Zone 2 and Zone 4 (ischemic zone) atrophies at a faster rate than Zone 1 (traumatic zone) and zone 3. The need for restoring the distal jaws with implants occurs as soon as the posterior teeth are lost, which may precede the loss of the anterior teeth. The distal maxilla does not possess good stability for the anchoring of the implants, because the bone volume is considerably low due to the remodeling, both from the oral and the maxillary sinus side. Moreover, the mineralization decreases progressively and rapidly as soon as the function is lacking. The posterior maxilla is usually rated as Type 4 bone (D4) according to the classification of Lekholm6 and class 4 to class 6 of Cawood and Howell classification7, 8. According Schnitman et al9, osseointegration is often not achieved in the posterior maxilla, only 72% of the implants are successful. Techniques have been developed to use mainly the Zones 1 and 3 in both jaws with All on 4 or All on 6 being the most popular techniques. Disadvantages of this strategy are higher stresses on bone and implants and the necessity to place the implants under an angle to surface of the bone. Cantilevers longer than 15mm have been associated with increased implant failure rates. Implants anchored in the dense cortical bone of the pterygomaxillary region take advantage of the high local mineralization for their anchorage in the cortical bone areas10, 11, Fig. 1a and 1b. Conventional 2-stage implant strategies in Zone 2 include sinus augmentations, these procedures increase the available bone without solving the problem of the lower mineralization in this zone. Usage of the pterygoid plate of the sphenoid bone seems a logical strategy, considering the anatomy and the high quality of that bone. Tuberosity implants1213and implants in the zygomatic bone14 are two other options availed to restore the distal segment of maxilla. They utilize the fact, that the bone of the maxillary tuberosity allows good implant integration, although it is not used in immediate loading protocols.Tulasne11, 15 first described the technique of tubero-pterygoid implants. The technique includes to pass through the tuberosity of the maxilla and to anchor implants into the pterygoid plate of the sphenoid bone.Ihde16-18 and Scortecci19 et al described the usage of tubero-pterygoid screw implants in combination with lateral basal implants (Disk Implants, BOI). They recommended this combination for immediate loading protocols.

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Fig. 1b:In lateral view different shapes of pterygoid apophysis



Implant techniques for the posterior maxilla: Implants

Treatment options for cortically anchored basal screw implants (BECES) (Strategic Implant® brand, Manufacturer Simpladent GmbH, CH-8737 Gommiswald) are described, Fig. 2,3 and 4.The standard treatment includes placement of one or two implants with an apical thread of 3.6 mm diameter in the adequate length into the pterygoid plate of the sphenoid bone. Mostly implants in 17 mm, 20 mm, 23 mm or 26 mm are used. Our approach differs from the technique described by Scortecci et al19, who uses implant in lengths of up to 44mm length.The implants are then splinted with a metal-to-acrylic or metal-to-ceramic bridge within maximum of 3 days, and the construction is then right away subjected to full functional immediate loading. Instruments The slot for the implant has to be prepared up to a width of 2mm and in adequate length. It is advisable to use a thin and conical —pathfinderl drill first to explore the location of the cortical plate. The drills can be used on the straight hand-piece or on the handgrip for manual use. We prefer to use the handgrip for implant insertion because it allows to direct the implant into the desired direction.

Fig. 1a: Panoramic picture of the distal maxilla, showing differences in mineralization. High mineralization if found in the premaxilla (left in the picture) and in the area of the pterygoid plate of the sphenoid bone (right in the picture). The distal maxilla provides low mineralized bone (D4) and the 1st cortical is almost missing in the area of the maxillary tuberosity.

Fig 2: Fully polished, single-piece screwable basal implant (BECES) (Strategic Implant ®, Manufacturer: Simpladent GmbH, Dorfplatz 11, 8737 Gommiswald, Switzerland)I ncl. an abutment head for cementation.



Fig. 3: Drills and instrument kit. The drills are used preferably in a straight handpiecewith 1:1 transmission.



Fig. 4 Instruments required according to manufacturer. Drills and pathfinder drill may be used with the handgrip instead of using the straight handpiece 1:1.



Anatomical Considerations:

The target area for the apical thread of the implant is the fusion area between the distal maxilla and the pterygoid plate, where two corticals are usually fused. An ideally placed implant would perforate the cortical of the pterygoid process into the pterygoid fossa, thus contacting the attachment area of the medial pterygoid muscle, Fig5& Fig. 6.The average height of the fusion zone between maxilla and sphenoid bone is around 13mm, the anterior-posterior thickness of this zone can be between 3mm and over 6.5mm, the medio-lateral distance (width) being 9.5mm20. The average length from the tuberosity to the most apical point of the pterygoid apophysis is 22.5mm + – 4.8mm21, 22.The pterygoid site is reasonably safe surgical site if operated under full knowledge of the anatomy and with caution, sinceno anatomically significant structures are presentin the vicinity of the implant. The maxillary artery passes along the outer side of the lateral pterygoid muscle upwards, until the pterygo-palatatine fosse. There it crosses medially over the muscle into the center of the skull23. The medial pterygoid muscle occupies the majority of the space between the pterygoid plates. The fusion are is the thickest area of the plate, and it is located in the (vertically) middle part of the pterygoid process. This area is the ideal site for one or two implants.

If the implant is inclined too much medially, it will engage rather in the lateral wall of the nose. If the implant is inclined too much laterally, it will engage into the lateral pterygoid muscle and typically this will cause pain during changes in the mouth opening. The palatal artery will be hit only, if the implant crosses over too much to the medial side. This is typically a minor complication if no flap ismade: the bleeding is stopped by placing the implant and application of pressure. The direction of insertion depends on the atrophy of the jaw: Because the maxilla grows much longer than the pterygoid process, it reaches a larger width. If the implant is placed right after extracting the 2nd or 3rd molar, the drilling and later implant will be directed medially, Fig. 7.In moderate maxillary atrophy the implant will be more in the sagittal plane, with less angulation towards the medial, Fig. 8.If the maxilla is heavily atrophied however the implant points directly dorsally, or it even may be directed to the lateral. This is true independently if one or two tubero-pterygoid implants are placed, Fig. 9. The angle to the horizontal plane depends on the spatial relationship between the maxillary tuberosity and the pterygoid process of the sphenoid bone. If the pterygoid process is much more cranial compared to the maxilla, the direction is almost vertical or the point of penetration into the first cortical must be chosen far more anterior, Figs. 10&11 show examples of this angle. Fig. 12 shows an example with very anterior implant placement and insertion of the implant under an adequate angle into the pterygoid plate.



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Fig.6: Lateral view displaying the fusion zone of pterygoid plate (incl. Hamuli) and the distal maxilla. Above the fusion area the pterygo-maxillary fissure is visible.



Fig. 7: The pathfinder drill points distally and medially in cases when the maxilla is (not yet) atrophied.



Fig. 8: In moderate atrophy (Type 2) where the pterygoid apophysis is closer to posterior border of tuberosity cranially. The bucco palatal width is also sufficient but less than the Type 1. So the bucco-palatal angle is kept closer to 80 degree , keeping the Hamulus as reference point for direction.



Fig. 9: In cases of a severe atrophic posterior of maxilla (Type 3); the

Fig. 5: The tubero-pterygoid implant penetrates the pterygoid plate of the sphenoid bone and it is in contact with the attachment area of the medial pterygoid muscle.

pterygoid not medial to the maxillary tuberosity any more, but either right behind it or even disto-vestibular to it. This has a direct influence on the direction of drilling and insertion.



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Fig. 10: In cases where tubero-pterygoid implants are placed in medial direction, the heads show a buccal inclination. This allows free movements for the tongue. This figure shows also, that typically there will be no parallelism between the abutments of the anterior implants and the abutments in the distal maxilla.



Fig. 11: Left side parallel two implants engaging the pterygoid apophysis . Different angles are used in reference to Frankfurt plane to achieve the similar engagement variating from 60 degree to 80 degree.



Fig. 12: In order to engage into the tubero-pterygoid region under an adequate angle, the point of insertion for the implant must be more medially. In this example the tubero-pterygoid implant is the 3rd from the back. Two more implant are placed distally, their direction is by far more vertical, and the engage in the palatal bone of the maxilla and in the maxillary tuberosity only.



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tapping with pathfinder drill attached to handgrip and to use a final cylindrical twist drill, 2mm diameter, with an irrigated handpiece 1:1. The technique requires to percuss medial Hamulus notch from palatal aspect and extending to the Hamular process on the Medial Hamular Notch in the Oropharynx. This is the landmark which an operator feel and consider as a point not to deviate medially from it. The target area is around 5mm lateral to the notch. An angle of 45 degree to 75 degree +or- is kept in relation to the Frankfurt plane.

The implant is inserted at about 70 degrees towards the distal (measured against the vertical). The start point on at the crest will varies according to the atrophies treated. Here author classify the distal atrophy of maxilla in relation of pterygoid to tuberosity. The entrance point with a pathfinder attached with handgrip is taken at 2nd molar region as if entered from ideal 3rd molar region or tuberosity will be out at distal wall of tuberosity being short of pterygoid is tapped till it reaches the pyramidal process of palatine bone. A sudden —Belll sound is observed indicating engagement of mineralized cortical bone. The procedure is followed by using the gradation marked 2mm twist drill by 1:1 reduction hand piece. It's needed to perforate the pterygoid bone with twist drill to know the length required for the site. The medial Hamulus is used as the reference point for the flapless pterygoid placement. But when in doubt, the tissue can be reflected and with the periosteal elevator / rasper extending anterio-posteriorly at the vestibular sulcus the pterygoid bone is felt and the same direction used to place implant. Prosthetic considerations:

The importance of the pterygoid implants becomes obvious when we leave the panoramic view and realize in 3D-approach that support for all 4 corners of the maxilla is necessary and not only for the front. As soon as the distal maxilla is equipped with a reliable support, restoration becomes easy and implant dentistry becomes reliable. Rigid cross arch fixation keep the micro motion at minimal under 150 microns avoiding the fibro osseointegration26, 27. Unfortunately the direction of insertion into the maxilla is not vertical for these implants. Hence the unparallel abutments is a concern, Fig. 10. If the bone of the pterygoid plate is sufficiently mineralized- this can be verified during the process of drilling and implant insertion-, also the implants in this region can be bent manually. We use the medium size insertion tool in combination with the ratchet for this procedure. It is also possible to use the handgrip for bending. In any case some manual pressure from the back of the implant must be exerted to make sure the really the implant bends backwards and that the pterygoid process and/or the maxillary tuberosity do not break off. The second concern is the influence on speech function through distal abutment heads. If the heads are too much inclined to the midline (as shown in Figs 7,8 and 9), they may block the movement of the tongue. This negative influence on the speech is especially pronounced, if this functional blockage is given only on one side.

II. Discussion:

The pterygoid plate of the sphenoid bone is a reasonably safe surgical site if operated under full knowledge of the anatomy and with caution. If the placement of the implant is done correctly, no other anatomical structures can be harmed: The maxillary artery is located either vestibular to the lateral pterygoid muscle or above the muscle, and hence in regular cases more than 40 mm away from the point of implant insertion in the 1st cortical of the maxilla28, 29. The pterygoid muscles occupy the majority of the space between the hamuli. The thickest area being the middle part of the pterygoid process between the plates, an ideal site for implant anchorage. Care has to be taken not to deviate palatally, more than the reference point of the hamuli as we might encounter in its path, the greater palatal artery. When traumatized, the bleeding from this vessel can be controlled easily, especially if no flap was reflected.

The Mandible is excellent for absorptionand has thick corticals and trabeculae, maxilla acts for dispersion of forces and possesses thin cortical bone and sparse trabeculae and is also the weaker than the maxilla. Apparent density is lowest in the posteriormaxilla than any other region. We primarily lose 1st and 2nd molars due to periodontal diseases and because of high occlusal forces generated at the distal , thus leading to poor clinical success rate of implants in posterior maxilla30 .To overcome the weak quality bone of posterior maxilla and avoidance of cantilever in immediate functional loading protocol , pterygoid implants have become the atmost importance. Always the anchorage of 3rd cortical, extramaxillary cortical is desired30. In the stable pterygoid cortical minimal of 60N torque is achieved making the distal support most stable. When comparing the other restorative technique for posterior maxilla like sinus lift28, 29, short implants onlay grafts ,Zygoma, Le forte 1 surgery and intrapostional grafting, the flapless pterygoid is the most accepted technique . But the position of pterygoids in relation to Frankfurt plane can't be made as standard as the angle of pterygoid implants in relation to antero posterior plane and frontal plane (bucco palatal) varies by different approaches related to atrophies presented by different patients23.

III. Conclusion:

Placement of tubero-pterygoid implants has been reported in literature as a safe procedure in implant dentistry. Due to the high mineralization of the target bone, the implants are typically loaded immediately, i.e. within three days. Circular bridges or segment bridges (Fig. 13) for missing premolars and molars are the key indications. Even 2nd molars can be replaced in immediate load protocols, using 1-3 Strategic Implants, with at least one of them engaging in the tubero-pterygoid region, i.e. the pterygoid plate of the sphenoid bone. The procedure for the placement of this implant is easy to comprehend and practice, however it requires a profound understanding of the individual anatomic situation.

Fig. 13: In this case a tubero-pterygoid implant serves as a distal support for a segment bridge in the upper right jaw. Totally 4 implants are included. The anterior implant was placed utilizing canine bypass-technique. Loading was done within 48 hrs.

Surgical technique:

After the assessment of the pre-operative clinical requirements and radiological examination, the need for pterygoid implants is defined. Typically the placement of tuberopterygoid implant is required for distal support in the maxilla and the patients often request for a treatment involving immediate loading.Local anaesthesia of lignocaine with adrenaline is infiltrated into the retro maxillary area and on the palate, near the palatal foramen. We used the technique described by Valeron and Valeron24 and Penarrocha et al25 and modified by Ihde16. They have advocated to engage the pterygoid apophysis with combination of



References:

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[1]. Schlegel D. [Dental implantology--a review of the literature]. Deutsche zahnarztliche Zeitschrift 1974;29:176-186.

[2]. Ugurlu F, Yildiz C, Sener BC, Sertgoz A. Rehabilitation of posterior maxilla with zygomatic and dental implant after tumor resection: a case report. Case reports in dentistry 2013;2013:930345.

[3]. McFadden DD. Pre-prosthetic surgery options for fixed dental implant reconstruction of the atrophic maxilla. Annals of the Royal Australasian College of Dental Surgeons 2000;15:61-64.

[4]. Tolstunov L. Implant zones of the jaws: implant location and related success rate. The Journal of oral implantology 2007;33:211-220.

[5]. Tolstunov L. Combination syndrome: classification and case report. The Journal of oral implantology 2007;33:139-151.

[6]. Jemt T, Lekholm U. Single implants and buccal bone grafts in the anterior maxilla: measurements of buccal crestal contours in a 6-year prospective clinical study. Clinical implant dentistry and related research 2005;7:127-135.

[7]. Brindley S, Howell RA, Cawood JI, Butterworth CJ. Oral rehabilitation of a patient with diffuse lymphangiomatosis affecting the maxilla: a case report. The International journal of oral & maxillofacial implants 2006;21:459-464.

[8]. Cawood JI, Stoelinga PJ, Brouns JJ. Reconstruction of the severely resorbed (Class VI) maxilla. A two-step procedure. International journal of oral and maxillofacial surgery 1994;23:219-225.

[9]. Schnitman PA. The profile prosthesis: an aesthetic fixed implant-supported restoration for the resorbed maxilla. Practical periodontics and aesthetic dentistry : PPAD 1999;11:143-151. [10]. Tulasne JF, Riachi F. [Dental implant complications]. Journal de parodontologie

1991;10:219-225. [11]. Tulasne JF, Amzalag G, Sansemat JJ. [Dental implants and bone grafts]. Les Cahiers de prothese 1990:80-102.

[12]. Bahat O. Osseointegrated implants in the maxillary tuberosity: report on 45 consecutive patients. The International journal of oral & maxillofacial implants 1992;7:459-467.

[13]. Venturelli A. A modified surgical protocol for placing implants in the maxillary tuberosity: clinical results at 36 months after loading with fixed partial dentures. The International journal of oral & maxillofacial implants 1996;11:743-749.

[14]. Branemark PI, Grondahl K, Ohrnell LO, et al. Zygoma fixture in the management of advanced atrophy of the maxilla: technique and long-term results. Scandinavian journal of plastic and reconstructive surgery and hand surgery / Nordisk plastikkirurgisk forening [and] Nordisk klubb for handkirurgi 2004;38:70-85.

[15]. Tulasne JF. [Commentary on maxillary pre-implant rehabilitation. A study of 55 cases using autologous bone graft augmentation]. Revue de stomatologie et de chirurgie maxillo-faciale 1999;100:265-266.

[16]. Ihde S, Kopp S, Maier T. Comparison of implant survival with implants placed in acceptable and compromised bone: a literature review. Journal of maxillofacial and oral surgery 2009;8:1-7.

[17]. Ihde S, Eber M. Case report: restoration of edentulous mandible with 4 BOI implants in an immediate load procedure. Biomedical papers of the Medical Faculty of the University Palacky, Olomouc, Czechoslovakia 2004;148:195-198.

[18]. Ihde SK. Fixed prosthodontics in skeletal Class III patients with partially edentulous jaws and age-related prognathism: the basal osseointegration procedure. Implant dentistry 1999;8:241-246.

[19]. Scortecci G. Immediate function of cortically anchored disk-design implants without bone augmentation in moderately to severely resorbed completely edentulous maxillae. The Journal of oral implantology 1999;25:70-79.

[20]. Lee SP, Paik KS, Kim MK. Anatomical study of the pyramidal process of the palatine bone in relation to implant placement in the posterior maxilla. Journal of oral rehabilitation 2001;28:125-132.

[21]. Rodriguez X, Lucas-Taule E, Elnayef B, et al. Anatomical and radiological approach to pterygoid implants: a cross-sectional study of 202 cone beam computed tomography examinations. International journal of oral and maxillofacial surgery 2016;45:636-640.
[22]. Rodriguez X, Mendez V, Vela X, Segala M. Modified surgical protocol for placing implants in the pterygomaxillary region: clinical and radiologic study of 454 implants. The International journal of oral & maxillofacial implants 2012;27:1547-1553.

[23]. Turvey TA, Fonseca RJ. The anatomy of the internal maxillary artery in the pterygopalatine fossa: its relationship to maxillary surgery. Journal of oral surgery 1980;38:92-95.

[24]. Valeron JF, Valeron PF. Long-term results in placement of screw-type implants in the pterygomaxillary-pyramidal region. The International journal of oral & maxillofacial implants 2007;22:195-200.

[25]. Penarrocha M, Carrillo C, Boronat A, Penarrocha M. Retrospective study of 68 implants placed in the pterygomaxillary region using drills and osteotomes. The International journal of oral & maxillofacial implants 2009;24:720-726.

[26]. Krekmanov L, Heimdahl A. Bone grafting to the maxillary sinus from the lateral side of the mandible. The British journal of oral & maxillofacial surgery 2000;38:617-619.[27]. Krekmanov L. Placement of posterior mandibular and maxillary implants in patients with severe bone deficiency: a clinical report of procedure. The International journal of oral

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Franchise Opportunities with Simpladent Corticobasal Immediate Loading Dental Implant

Dr Neeraj Kaushik, Chief Advisor-Simpladent

A message from Chief Advisor:

We are thrilled to extend our warmest welcome to you as the members of the Simpladent Immediate Loading Dental Implant Clinic family! It is with great excitement that we embark on this journey together, as we join forces to expand our successful dental implant franchise and revolutionize the world of dental care.

At Simpladent, our unwavering commitment to providing top-tier dental implant services has allowed us to thrive and make a lasting impact on the oral health industry. We have witnessed countless lives transformed through our innovative treatments, and now, we are ready to share our formula for success with all of you.

As a Chief Advisor, I can confidently say that this is a pivotal moment for all of us. With your dedication and our proven system, we are poised for unprecedented growth. Your decision to join us as franchisees demonstrates your trust in our brand and your eagerness to make a meaningful difference in your community.

Our shared vision is one of excellence and accessibility, where patients across the globe can experience the life-changing benefits of immediate loading dental implants. We are united by our passion for providing top-quality dental care, and together, we will set new standards of innovation, efficiency, and patient satisfaction.

Throughout this journey, we are committed to providing you with unwavering support, comprehensive training, and the tools necessary to flourish in the dental implant industry. Your success is our success, and we are here to empower you every step of the way.

We are excited to foster a culture of collaboration, innovation, and continuous growth within our franchise network. Your insights and unique perspectives are invaluable, and we encourage you to contribute to our collective wisdom as we shape the future of Simpladent.

As we are about to embark on this new chapter together, I want to express my deepest gratitude for your trust in us. We firmly believe that the future of dental implant care is in our hands, and together, we will continue to transform smiles, restore confidence, and change lives. Welcome to the Simpladent family, where together, we will create a world of healthy, beautiful

smiles.

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& maxillofacial implants 2000;15:722-730.

[28]. Rodriguez X, Rambla F, De Marcos Lopez L, Mendez V, Vela X, Jimenez Garcia J. Anatomical study of the pterygomaxillary area for implant placement: cone beam computed tomographic scanning in 100 patients. The International journal of oral & maxillofacial implants 2014;29:1049-1052.

[29]. Rodriguez JC, Suarez F, Chan HL, Padial-Molina M, Wang HL. Implants for orthodontic anchorage: success rates and reasons of failures. Implant dentistry 2014;23:155-161.

[30]. Seong WJ, Kim UK, Swift JQ, Heo YC, Hodges JS, Ko CC. Elastic properties and apparent density of human edentulous maxilla and mandible. International journal of oral and maxillofacial surgery 2009;38:1088-1093.



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