shorter treatment time

Immediate molar placement using Ankylos implants

| Dr Howard Gluckman

INTRODUCTION

Historically, function was the highest priority in the field of implant therapy – however, today's priorities are esthetics and faster treatment. Patient expectations and requirements have led us to push the limits of our current treatment modalities, resulting in shortened treatment time without reducing the success rate. Immediate implant placement is well documented and has become the norm for implant placement. In the field of implant therapy, the molar site has always been a problem area. The multi-rooted anatomy of the teeth provides very little bone for primary stability of the implant, which is necessary for immediate placement. This means that either extremely wide diameter implants are required to utilize the buccal and palatal bone plates for primary stability or implants are placed in the palatal root. Another way to achieve primary stability is to utilize the bone apical to the tip of the root, however the inferior alveolar nerve and the maxillary sinus can limit the amount of bone available for this. Numerous studies have shown the great success of immediate molar placement in both the mandible and the maxilla. However, the majority of the studies have advocated the use of wide diameter or tapered implants with a wide neck in order to achieve primary stability. The purpose of this article is to illustrate the successful use of narrow diameter Ankylos implants placed in the inter-radicular bone septum in both maxillary and mandibular molar sites.

TREATMENT PROTOCOL

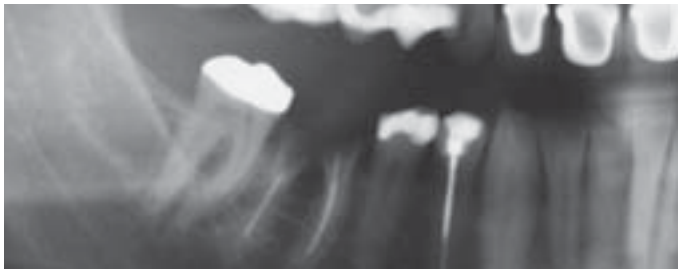
Included in this study were patients who required implants placed in mandibular (Fig. 1) or maxillary molar sites (Fig. 8). The only people excluded were those not medically suitable for implant therapy. Patients with periodontitis were first treated with closed therapy and then placed in a supportive periodontal program. Smokers and patients with acute or chronic apical pathology were not excluded in this study.

All molars were removed atraumatically by sectioning the roots into their individual components. These procedures were flapless unless better visualization was required to ensure that the socket was clear of any infected soft tissue (Fig. 13). In cases where there was thick furcation bone, a 2 mm round drill was used to make an initial landing site (Fig. 2). Thereafter, a 2 mm pilot drill was used to prepare the osteotomy to the correct depth (Fig. 15). The next step used the 3.5 mm drill as the final drill. The conical reamer was then only used if thick furcal bone was present. If the bone was thin and fragile, then it is advised to use this sparingly or not at all for the implant's primary stability. The implant was then inserted into the osteotomy. It is important to place the implant 1-2 mm below the bone in the furcation and not according to the buccal plate in order to ensure the correct three-dimensional implant height after bone remodeling (Fig. 3, 4 and 9). The remaining jump gap is then filled with a xenograft

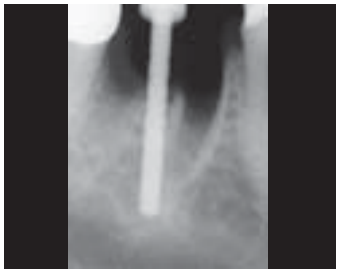
(Fig. 16), which is pushed to the most apical portion of the alveolus by means of a periodontal probe. Doing this prevents a bottleneck from forming, which obstructs the placement of bone into the most apical part of the alveolus.
In molars with insufficient furcal bone, found more often in maxillary molar cases (Fig. 8 and 13), osteotomes are required to expand the furcation bone rather than drill it away. This is accomplished by using the bayonet bone condenser starting with the position marker and expanding the osteotomy until the bone condenser for A-implants is reached (Fig. 14 and 15). The conical reamer is only used in denser bone. The roots are then filled with the xenograft as per the lower molars (Fig. 16).
It is not always possible to use the bone condensers in the lower jaw, as the jaw moves every time you tap it. Therefore, for thin furcation bone it is ideal to use a piezo-surgical unit to prepare the osteotomy, as it puts far less force on the bone. It is also safer when working close to the sinus and the inferior alveolar nerve.
Most of the implants were performed using a torque exceeding 35 Ncm and succeeded in having transgingival healing. Only two cases required soft tissue coverage due to complete lack of primary stability (Fig. 17 and 18).
The cover screw is then removed and a Balance gingival former is placed for transgingival healing (Fig. 4). In cases where there was no primary stability (maxillary molars), a rotated palatal flap was used to achieve primary closure of the implant. All other implants were left to heal with a transgingival approach. The edges of the extraction socket were pulled together using chromic sutures. No attempt was made to undermine the soft tissue in order to encourage primary closure of the flap. Any exposed area of bone was left to heal by secondary intention.
Sutures were removed after 7-10 days and the patients were followed-up after one month. In cases with excellent primary stability, the integration was checked at two months and the final restoration was created (Fig. 5, 6, 11, and 19). Cases with poor primary stability but with transgingival healing were given three months integration time before the final restoration was placed. Cases that had subgingival healing were exposed after four months and allowed to heal for two months before the final restoration was placed. These implants were then bone trained in order to improve the bone-to-implant contact before final restoration.

1_Radiograph showing a severely decayed tooth that is unsalvageable
2_Depth guide in place showing the position of the initial drill in the furcation bone
3_Ideal implant placement in the furcation: 1 mm below the level of the furcation bone
4_Implant in place in the furcation bone
5_Follow up after 24 months: notice the excellent emergence profile of the final crown
6_Follow up after 24 months: occclusal view

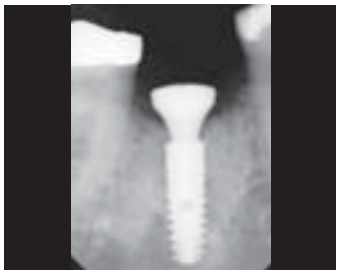
1_



2_



3_



4_

5_

6_

7_Follow up x-ray after 24 months: demonstrates the Ankylos TissueCare Concept that features bone over the implant shoulder
8_Radiograph of tooth 16 shows the preparation of the furcation area
9_Radiograph immediate post-op with vertical sinus lift
10_Healthy gingiva three months after placement and ready for final impression
11_Final crown 15 months post-op: note the excellent emergence profile
12_Follow-up x-ray after 15 months: note the remodeling of the bone due to Ankylos TissueCare Concept
13_Furcation bone after atraumatic extraction of the roots. Apical pathology still present
14_Bone condensers to expand the furcation bone

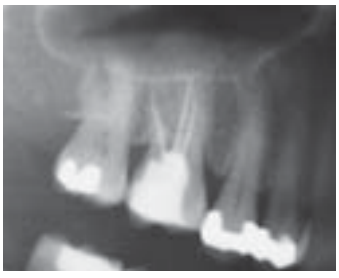
RESULTS

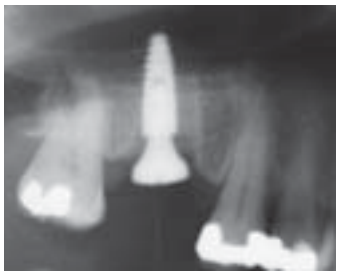
In total, 100 molar implants were placed, of which 64 were mandibular and 36 maxillary. The implants have been followed up for a period of 1-24 months. There were no soft tissue complications and no implants were lost during this time. The treatment was often finished after two months and only the few cases that did not have adequate primary stability required longer treatment. Only two implants required soft tissue coverage. A few cases required slightly larger diameter implants, as the furcation bone was either non-existent (conical shaped roots) or too thin for primary stability. No sites were aborted due to poor bone or poor stability. Soft tissue healing was almost complete within seven days and all implants displayed healthy soft tissue at the time of integration assessment.

DISCUSSION

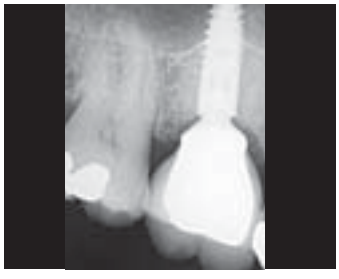
Immediate molar implant placement has been well documented and has had great success. However, much of the literature advocates the use of either wide diameter implants in order to achieve primary stability from the buccal and palatal bone or implants that are longer than the roots in order to utilize the bone apical to the roots. Although they boast excellent results, some studies fail to mention that the implants in a number of cases had to be aborted due to insufficient primary stability. A negative factor of wide diameter implants is that there is a high risk of buccal bone loss, which is more marked in the molar area than in premolar sites. With this in mind, there is potentially a high risk of buccal recession and a resulting exposure of the buccal threads. Implants placed in the palatal root of the maxilla have a much lower success rate (82 %) over 5 years. This may be due to the “off-axis-placement” of the implant and the cantilever effect produced by the crown. Narrow diameter implants do not have the same risk as wider diameter implants, because there is little risk of bone remodeling up to the middle of the furcation – the ideal position for the implant. The furcation also offers far better stability for the narrow diameter implant without requiring usage of apical, buccal or palatal bone. The final drill for the A-implant does not damage the furcation bone (Fig. 2 and 3). However, the larger the drill size, the greater the amount of damage caused by vibration to the remaining furcation bone, which thereby reduces

7_ 

8_ 

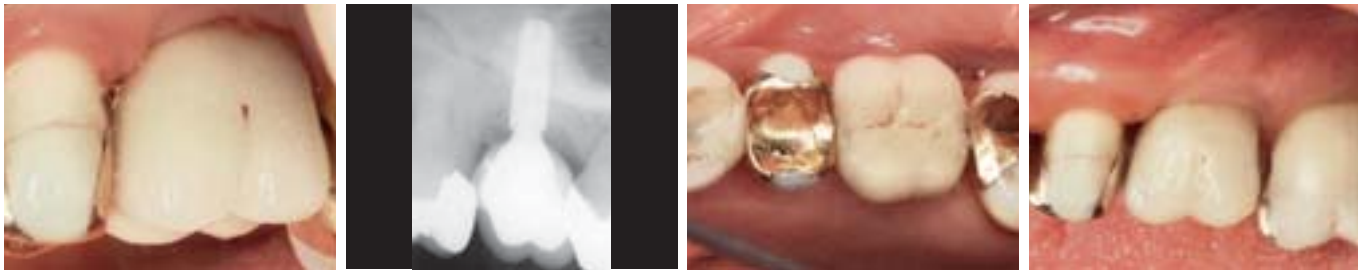
9_ 

10_ 



11_ 12_ 13_ 14_

15_ 16_ 17_ 18_



19_ 20_ 21_ 22_

the chances of primary stability for wider diameter implants. The thread design of the Ankylos is ideal for this type of treatment as most of the primary stability is achieved from the apical threads and no force is placed at the coronal section.

Wide diameter implants are generally placed in molar sites to compensate for the screw-retained connection. The wider diameter reduces the micro-motion and hence reduces the risk of screw loosening and possible implant fracture. The Ankylos system does not have this problem. The tapered connection and the TissueCare Concept (Fig. 7, 12, and 20) are capable of withstanding the stresses of the molar region without the risk of screw loosening or implant fracture. The use of a narrow diameter implant reduces the amount of bone damaged during preparation. This allows implant placement in every case without having to abort the procedure due to insufficient primary stability. Immediate molar placement with narrow diameter implants is a successful treatment protocol. The Ankylos implant provides a system that permits ideal implant placement in molar sites by means of its excellent design. The thread design and surface characteristics provide excellent primary stability in minimal and poor quality bone, resulting in rapid integration and dramatically shortened treatment time. The tapered connection allows narrow diameter implant placement without the risk of screw loosening or implant fracture.

As our patients get older they have an increased number of medical conditions with the concomitant increased use of medication that needs to be taken into account before and after surgery. Patients are also more frail and require treatment plans that takes these factors into account. Reduced treatment time as well as reduced number of treatments is what is necessary to reduce the risks associated with the treatment. Reducing the number of treatments that they require by placing an implant at the same time as the extraction reduces the medical risk for these patients as they do not require the multiple treatments normally associated with implant placement in the molar areas. Any immediate implant placement is ideal for our ageing population as this treatment protocol fulfils our patients requirements for minimal and speedy intervention. The molar site has always lagged behind other areas of immediate implant placement. For the first time the Ankylos implant has given us the ability to immediately place implants in molar sites in all situations. ■

Literature from the author on request

15_Final preparation of the osteotomy with osteotomes
16_Implant in position with synthetic bone packed into the socket
17_Only two of one hundred patients needed submerged healing due to insufficient primary stability
18_Situation after four months
19_The final crown. Notice the emergence profile
20_Excellent bone growth over the top of the implant after four months of healing
21, 22_The final crown after four months in place

Dr Howard Gluckman
39 Kloof Street, Gardens
Cape Town, South Africa
docg@mweb.co.za