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Patients wearing full dentures have constant quality of life issues and battle every day to maintain their lifestyles in an acceptable manner. The sad fact is that there are 39 million denture wearers in the United States. We know that people are living longer. We know that, due to the cumulative effect of caries and periodontal disease, the longer we live, the more teeth we loose. Even those individuals that have reasonable fitting dentures, must face the accepted fact that, over time, bone resorbs because of a lack of stimulation from either teeth or implants and the pressure of the hard denture acrylic.

Millions of people wear full dentures that are ill-fitting, unstable and prevent them from enjoying an acceptable quality of life. According to Gordon Christensen at the Chicago Midwinter 2005 Dental Conference, 90% of all denture wearers are dissatisfied with their lower denture. To keep dentures fitting accurately, relines every few years become a way of life, to the distress of both doctor and patient. Some even reach the point where so much bone resorbs that relining is no longer effective.

History

While many implants were placed in the 60's and 70's, it wasn't until the 1980's that techniques and biocompatible materials were refined enough to achieve a high rate of success. This led to the American Dental Association granting provisional acceptance to implant treatment in 1986. In the early 1990's, Bernard Weissman, President of Dentatus USA, and who early on understood why so many implant treatment plans did not get accepted,

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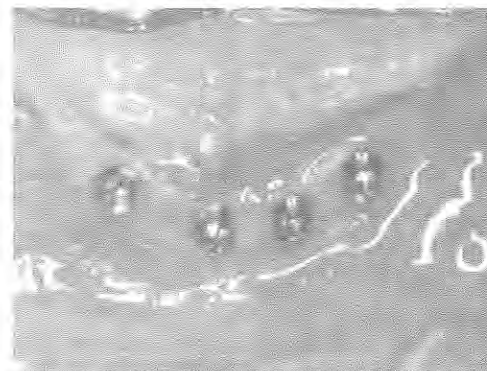


Fig. 1 - Occlusal view after insertion of 4 Atlas implants. Platform sits flush with the soft tissue. Silicone relines will grip the implant heads for retention.

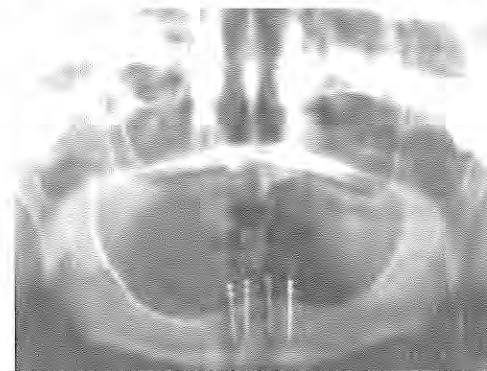


Fig. 2 - Panorex of 4 Atlas implants.

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decided on a different approach. He developed the transitional implant, which was a narrow-bodied [1.8mm diameter], one-piece, self-threading implant that would be installed at the same time of stage-one implant surgery, but immediately loaded. This was an amazing breakthrough, since for the first time, patients undergoing edentulous implant treatment never had to be without teeth and, yet, the surgical site would remain completely protected. Not only were these implants much smaller in diameter than what was traditionally being utilized, but also they contained no holes or wedges into which the bone could grow. The major questions then became, how long would these narrow-bodied implants last? Would they actually osseointegrate?

Histology

The NYU Dept of Implant Dentistry conducted human histological studies in 1996 as did the Loma Linda University Center of Prosthetic & Implant Dentistry in 1998. After 8 months a core of the implant and bone was taken. The histological data indicated that (1) the apical half of the implant had 50% osseointegration with dense trabecular bone growth (2) There was new bone growth in the coronal aspect of the implant and (3) there was an undetectable inflammatory response. ^{1,2}

More recently, from a paper published in The International Journal of Oral & Maxillofacial Implants from research done by Dr. Stuart Froum et al at New York University, on narrow-bodied transitional implants, it was concluded that, "The percentage of BIC achieved with Tis was similar to that documented in the literature for conventional turned, machine-surfaced implants." ³ The NYU research indicated that the average percentage of bone to implant contact was 52.9% + or - 13.81%. Part of their conclusion was that although transitional implants are typically removed when the definitive implants are restored, the results of their study suggested a change in the transitional implant protocol.

Several factors have contributed to the success of the narrow-body implants [up to 3 mm in diameter]. The precursor to good osseointegration is stabilization. Since these implants are so narrow, they are almost always placed in good hard bone and are immediately solid and immobile. Part of the healing and osseointegration process with implants involves the return of circulation to the surgerized area. The technique for narrow-body implants being minimally invasive removes far less bone in the drilling of the osteotomy with less interruption of the circulation.

FDA Approval

In 2004 the FDA approved the Dentatus titanium alloy self-threading implants "for long-term use and for any length of time as decided by the healthcare provider." Other narrow-bodied systems also have that designation. The FDA approval is a significant milestone in implantology and should open up the opportunity for implant therapy to many more patients. Narrow body implants are not meant to replace the traditional wide body implants. But, it's been estimated that 25-30% of all patients who could benefit from implant treatment never have the treatment because of ridges that are too narrow, or limited vertical and/or interproximal space and/or the inability to pay for the treatment. What about the very elderly or those patients with systemic problems and/or those undergoing radiation or chemotherapy? Now there is a cost-reasonable alternative to the traditional implant protocols.

Implant Trends

Since the initial development of implant protocols and the two-stage surgery technique trends are changing, and implant treatment has come full circle. Implant companies are reaching out to all restorative dentists. There is a push to have general dentists in many instances place the implants as well as restore them.

So, the implant protocols are being made easier and simpler. One-stage surgery with one-piece implants that are immediately loaded is becoming more accepted. Nobel Biocare [1-800-993-8100], whom most would recognize as the giant in the implant industry, recently introduced their NobelDirect™ - a 3.0 mm diameter implant "for direct insertion and direct use. A biologic implant with an anatomic design, all in one piece." And several companies have been emphasizing that their definitive implants should be immediately loaded. Both the surgical and prosthetic protocols are getting back to the basics and the "less is more philosophy" is becoming prevalent.

These trends are very appealing to patients and will help "sell" implant treatment. For example, patients love to hear that they will have teeth immediately. Flapless surgery has increased case acceptance [fig 3]. Patients who have heard nightmare stories, whether true or not, from friends or relatives who have

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previously undergone implant treatment quickly enter a zone of comfort when they hear, "Your gums do not have to be cut open, and there will be no stitches."

Because of the success of narrow-body implants and their acceptance by patients, many other implant companies have entered this market since Dentatus including, Imtec [1-800-879-9799], Bicon [1-800-882-4286], OCO Biomedical [1-800-228-0477], Intra-Lock [1-877-886-0657], Biohorizons [1-888-246-8338], Osteocare [+44 (0) 1753 770006] and Sterngold [1-800-243-9942].

Atlas/TufLink

For the purposes of this article, I will focus in on one technique of providing retention for a mandibular denture and one particular narrow-body implant system - Atlas®/TufLink™ [Dentatus USA 1-800-323-3136]. The Atlas implants are manufactured with class 5 titanium alloy and have threads that have been mechanically roughened. They come pre-sterilized.

Advantages

The entire procedure of placing the Atlas implants and relining with the Tuf Link silicone will take about an hour. The length of treatment time is significantly reduced since the surgical portion foregoes the traditional 2-stage surgery. The narrow-body implants are placed without reflecting a flap and are immediately loaded. Since there are little to no lab fees and the implants/components are less costly, the procedure is more affordable to a greater number of patients.

The soft silicone reline material cushions the bony ridge against the forces of mastication and prevents resorption of bone caused by the pressure of the hard denture acrylic. Patients can sleep with their denture all night.

But, perhaps the greatest advantage to the Atlas system is that, unlike all the others, it requires no O-rings or housings to be retrofitted. Therefore, parallelism discrepancies are rarely a problem, since no copings are utilized, since the Atlas implant head protrudes only 3 mm from the soft tissue and since the silicone reline is resilient.

Problems

Those clinicians whom have used other systems with copings understand the problems. Often, the patient's denture is old and thin, without enough acrylic to hollow out. It's not uncommon to drill through the lingual of the denture or into the teeth, trying to create enough space to accommodate the housing. If the implants have not been placed parallel to each other, the retrofitted housings will place tremendous pressure on the implants during mastication and each time the denture is removed or put back in by the patient. It has been reported by some patients that the retention was so tight, that they need to pry the denture out with a spoon. This type of pressure may doom the implants to failure.

Step-by-Step Technique

All general practitioners already have the skills to execute the surgical aspect of this technique. The key is to stay safely anterior to the mental foramina.

Periapical and/or occlusal radiographs can be taken to determine the amount of vertical and horizontal bone. This can be augmented with physical measurements. The Atlas implants are available in 2.2 mm and 2.4 mm diameters and three different threaded lengths - 7 mm, 10 mm and 14 mm [fig. 4]. The difference in diameters has nothing to do with strength but with larger surface area for better osseointegration. When possible, try to use the 10 mm or 14 mm threaded lengths.

Surgical

The location for each osteotomy should be marked on the edentulous ridge with a sterile marking pen, or a surgical guide may be utilized to ensure proper positioning. The Dentatus protocol

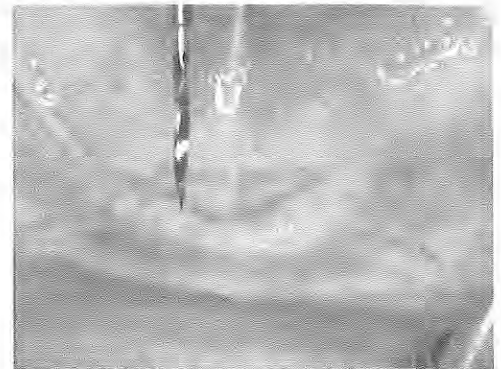
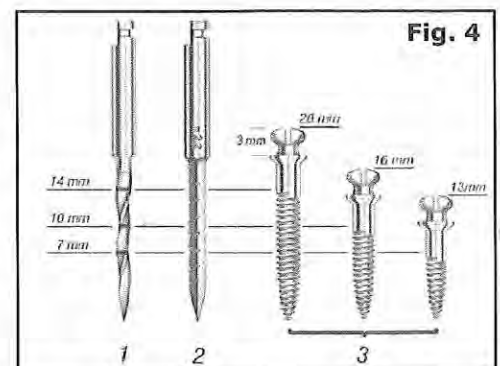


Fig. 3 - The Profile drill, without opening a flap, will create an osteotomy for the narrow-body implant.



recommends utilizing 4 Atlas implants, two on each side of the midline for balance.

Local infiltration provides adequate anesthesia in most of these cases, but if bilateral mandibular blocks are necessary, use a short lasting local anesthetic. Once the patient is anesthetized, the dentist can use a periodontal probe or the Profile twist drill with a rubber stopper to punch through the soft tissue to bone where the implants will be placed. The thickness of the soft tissue should be recorded and taken into account when drilling the flapless osteotomy.

Osteotomy

The osteotomies are made with the Profile needlepoint drill [fig. 5] at 2,000-2,500 RPM using a copious stream of biocompatible sterile water or saline solution to prevent overheating the surrounding bone. In mandibular D-1 and D-2 hard bone, the osteotomy should be drilled one millimeter past the full depth and then further enlarged with the corresponding reamer for safe, stress-free installation of the implants. A new Profile drill should be used for each case and then discarded as a safeguard against overheating because of dull drills. If there is a buccal concavity, the drill should be angled slightly towards the lingual to prevent perforation of the buccal plate. Try to keep the four osteotomies parallel. However, parallelism discrepancies are rarely a problem, since no housings or copings are utilized with this technique, the Atlas implant head protrudes only 3 mm and the silicone reline is resilient.

Widen the osteotomy with the 2.2 mm reamer [fig 6]. This is important since the Profile drill is only 1.3 mm in diameter and, if the canal was not wide enough, you could get compression necrosis trying to insert the implant.

Remove the Atlas implant from its sterile vile, holding it by the plastic carrying instrument, and insert the implant into the osteotomy until several threads engage [fig. 7]. Using the slow speed RA driver at 50 RPM, insert the implant about half way. Do not insert the implant to the full length of the osteotomy with the RA driver or the torque may cause the implant to bottom out and damage the bone.

Using the hand driver or ratchet, complete the installation of the implant [fig. 8]. Don't be afraid to

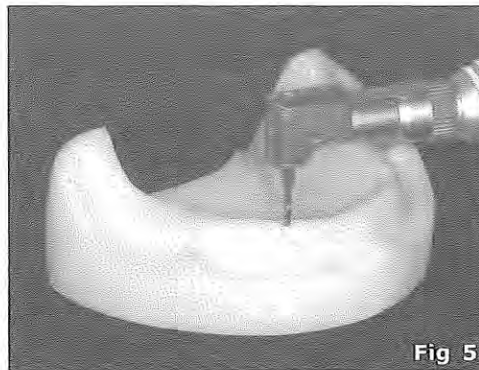


Fig 5

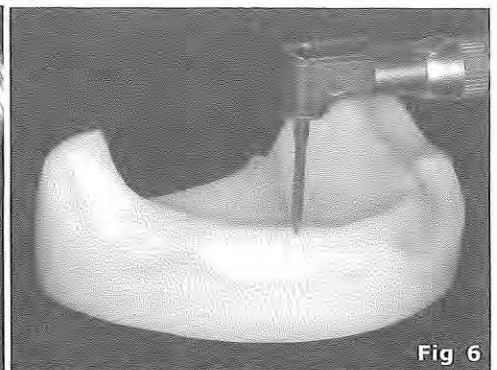


Fig 6

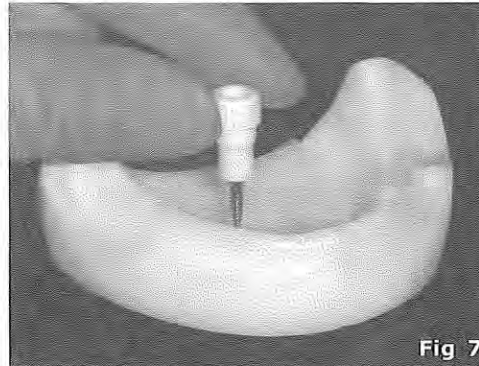


Fig 7

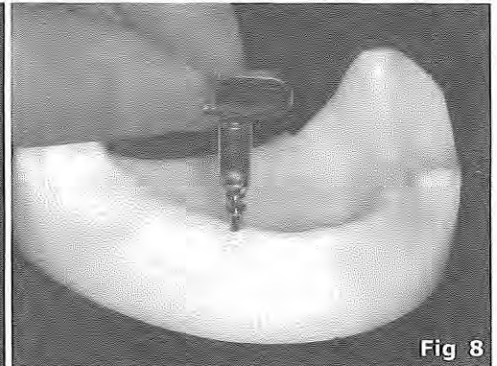


Fig 8



Fig 9



Fig 10

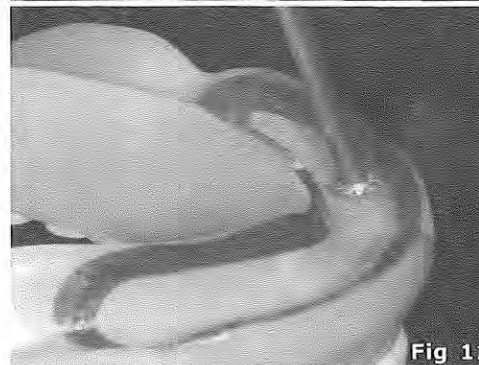


Fig 11

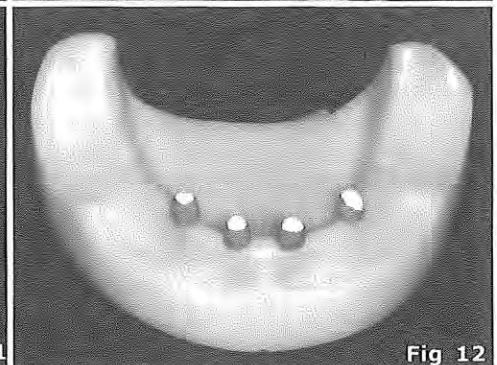


Fig 12

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apply pressure. If you meet too much resistance, back the implant out and widen. The implant platform should be flush with the soft tissue ridge [fig. 9]. Note: This model has no soft tissue, so the implants sit on the bone. But, clinically the collar abuts the soft tissue and the smooth surface below the platform is in the soft tissue [fig 1].

Prosthetic

Using the marking pen, delineate the area of the denture to be relieved, about 2 mm from the edge of the flange and just short of the retromolar pads [fig 10]. Using the half-round #1 denture cutting instrument, create a seam with an undercut at the 2 mm mark around the entire periphery [fig. 11].

Place plastic marking caps on the four Atlas implants. Cover the marking caps with whiteout [fig. 12]. Place the denture over the ridge in the correct approximate position and apply pressure against the marking caps. Check the ridge side of the denture; there should be four recognizable marks indicating where the denture will have to be relieved to create clearance for the heads of the Atlas implants [fig. 13].

Using the #2 round carbide bur, hollow out the four marked areas to 4 mm depth (width of bur) [fig. 14]. Remove the marking caps and try the denture on and off. It should not bind.

Using the #3 round diamond cutting instrument groove out the remaining acrylic and smooth out the grooves with the round carbide cutting instrument. This will result in a space about 1-1.5 mm deep within the borders of the delineated area [figs. 15 -16]. Use a toothbrush to remove excess acrylic and wet towel to remove the ink.

Silicone Reline

Extrude Tuf-Link silicone material onto a pad and spatulate for 30 seconds [figs. 17-18]. Spread the mixed Tuf-Link along the seam, the relieved areas of the implants and fill the hollowed-out portion of the denture base. Do not be afraid to overfill since it is trimmed easily with a scissors [fig. 19].

Place the denture over the mandible from the posterior and have the patient bite down and hold the denture in place for 4-5 minutes. When the silicone reline material is set, carefully remove it from the denture and trim the excess with a scissors [figs. 20 -21].

Press the trimmed silicone reline back into the denture base [fig. 22]. Notice the four openings in the silicone reline that will grip the implant heads to provide retention and stabilization.

Patients will love the Atlas procedure since they will never be without teeth. Esthetics and function will be restored immediately. They can continue their daily activities without missing a beat. If you present

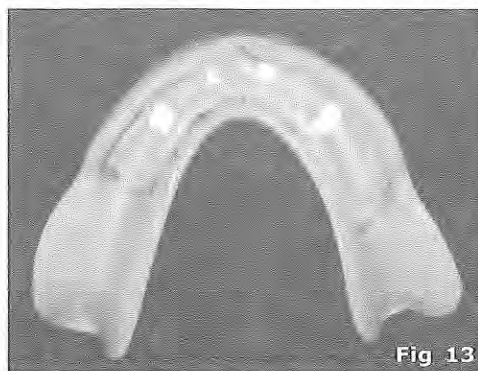


Fig 13



Fig 14

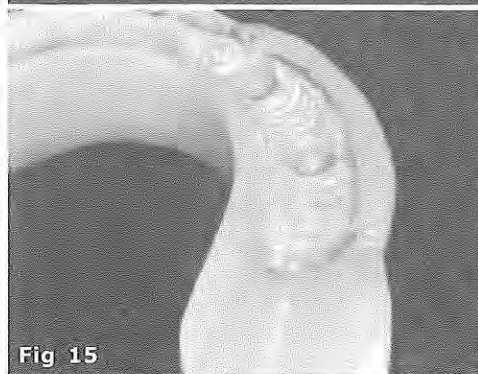


Fig 15

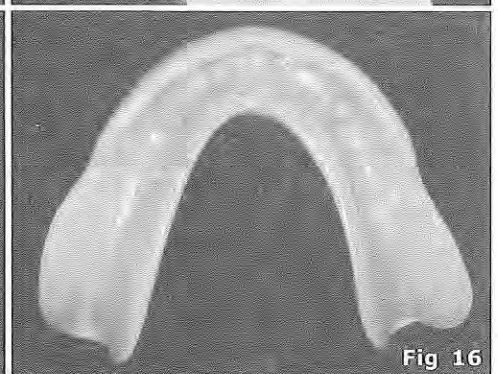


Fig 16

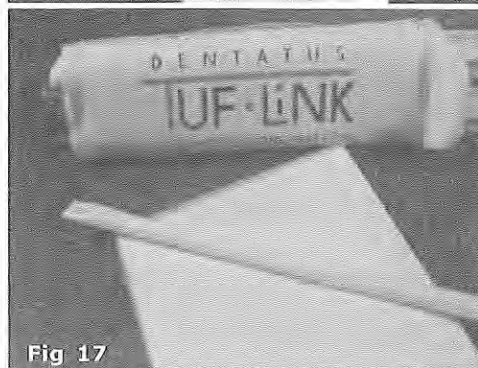


Fig 17

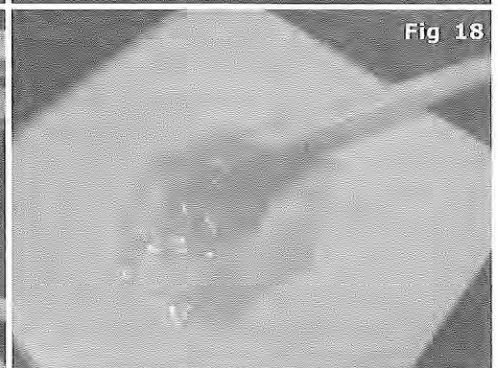


Fig 18

these amazing advantages in the proper context, patients will readily accept your implant treatment plans and the Atlas protocol will become an excellent implant practice builder.

References

1. Tarnow D, Froum S: A Case Report and Histology of MTI Modular Transitional Implant. NYU School of Dentistry May 1996. Abstract.
2. Bohsali K, Simon H, Kan JYK, Redd M: Modular Transitional Implants to Support the Interim Maxillary Overdenture. Compendium, Vol. 20, No 10, Oct. 1999.
3. Froum S, Simon H, Cho S, Elian N, Rohrer M, Tarnow D: Histologic Evaluation of Bone-Implant Contact of Immediately Loaded Transitional Implants After 6 to 27 Months. The International Journal of Oral & Maxillofacial Implants, Vol 20, No 1, pgs. 54-60. Jan/Feb 2005.

Note: Dr. Rossein teaches a hands-on workshop utilizing this technique. For dates, places and additional information call Dentatus at 800-385-1535.

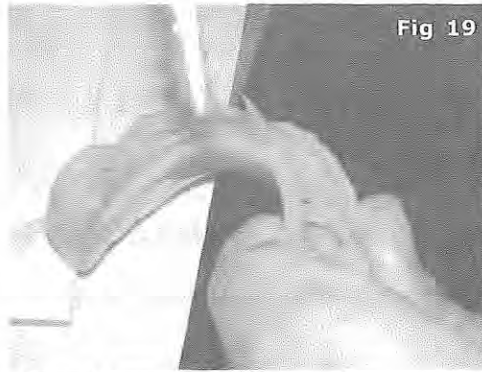


Fig 19

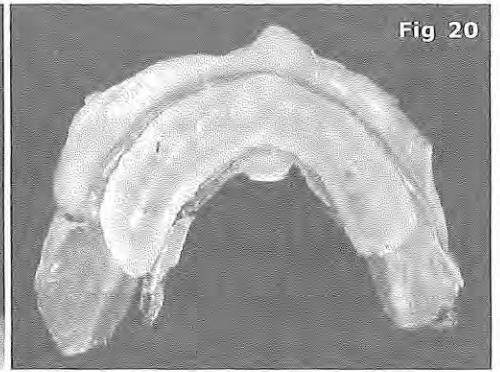


Fig 20

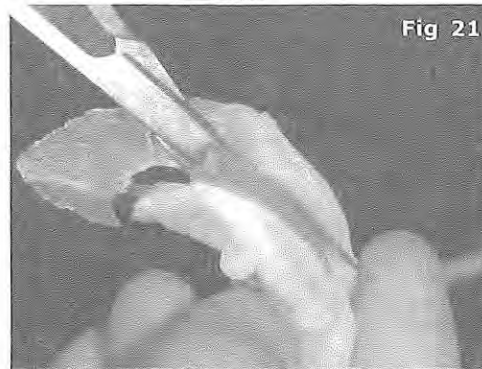


Fig 21

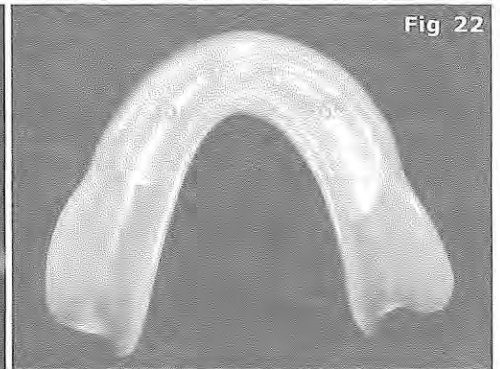


Fig 22

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