

Completely limiting Design:

This design restricts all of the instruments used for the osteotomy in a buccolingual and mesiodistal plane. Moreover, the addition drill stops limits the depth of the preparation, and positioning of prosthetic table of implant. This includes two popular designs: cast-based guided surgical guide and computer-assisted design and manufacturing (CAD/CAM) based surgical guide.

a) Cast-based guided surgical guide:

It is combination of an analog with bone surrounding and use of periapical radiograph in a conventional flapless guided implant surgery. This radiograph is modified using digital software to help in transposition of root structure onto the cast. Cast is then sectioned at the proposed implant site and bone-sounding measurements are transferred to help in orientation of drill bit to perform a cast osteotomy. A lab analog is placed in the site, and a guide sleeve consistent with implant width is modified using wires that are used to create a framework around the teeth. Occlusal registration material is used to form superstructure.

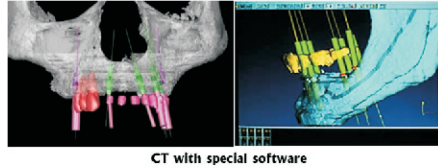
b) Computer-assisted design and manufacturing(CAD/CAM) based surgical guide:

It includes use of navigation technique. There is no guidance of the drills, but software provides real-time feedback to the surgeon in order to compare execution with planning. Therefore modifications are possible during surgery if necessary. It uses data from CT to plan implant rehabilitation. The images by CT are converted into data that are recognized by CT imaging and planning software. This software then transfers this presurgical plan to surgery site using stereolithographic drill guides. Multiple engineering techniques such as laser sintering are available to fabricate 3D models.

A layer of liquid polymer is deposited and cured by a computer driven laser. Additional layers or sections are stacked and polymerized until a final model is generated. The accuracy of anatomical models generated by this method depends upon the quality of the CT scanner and the thresholding method, but the studies have shown a dimensional stability in the range of 0.6 mm. For fabrication of dental implants surgical guides, the dentist's plan is used to design the guides, and CT files are used to prepare the guides to be borne on hard or soft tissues. Software programs are capable of maximizing stability and implant retention by detecting the best insertion path while avoiding undercuts within the bone. Designs also include irrigation holes, sufficient surface areas to maintain finger pressures while performing osteotomies and other specific features such as buccal extensions if a transversal retention screw is desired.

In addition, serial templates are fabricated to accommodate increasing drill diameters. Once designs are completed, the guides are processed with the stereolithographic method and stainless steel tubes are later pressed into

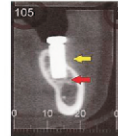
place. The dentist receives the anatomical model and surgical guides by mail and can observe the anatomy before proceeding with surgery. Because the topography is obtained from the CT scan data, this process is best suited for osseous – supported templates with wide edentulous areas.



CT with special software



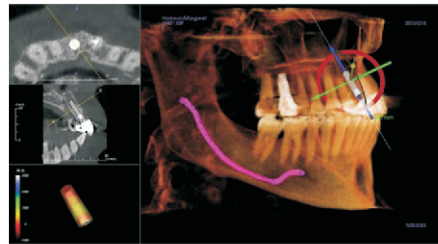
Plastic Surgical Guide



Dental Implant CT scan

CAD –CAM computer driven drill press system. The scannographic template is repositioned on the model and registered using fiducial markers. A computer drives angulations to produce planning and convert the template into an accurate surgical guide.

Some computers are equipped with audible or visual warnings when osteotomies deviate from planning or when a vital structures is about to be entered. One example of such application is marketed under the name IGI (Image Guided Implantology, Den X, Jerusalem, Israel). Another similar system is the Virtual scope.



Advanced Implant Surgery

Fabrication of surgical template: For Edentulous Patients:

This easiest method is used in clinics to construct the implant surgical template is to use a modification of Preston's clear splint for the diagnosis of tooth contours, tooth Position and occlusal form. The diagnostic wax-cast is completed to determine tooth size, position, contour, and occlusion in the edentulous regions where implants will be inserted. No selective grinding or modification is performed on any teeth that have not been altered prior to surgery; otherwise, the template will not fit correctly in the mouth. A full arch irreversible hydrocolloid impression is made of the diagnostic wax-up and poured in dental stone.

On the duplicate cast of the wax-up teeth, a vacuum acrylic shell 0.060-0.080 inch is pressed and trimmed to fit over the teeth and gingival contours of the buccal aspect of the

ridge. If no natural teeth remain, the posterior portion of the template should be maintained and cover the retromolar pads or tuberosities to aid in positioning. The occlusal acrylic is trimmed over the ideal and optional implant sites, maintaining the facial and facio-occlusal line angle of the surgical template. A black line then is drawn on the template with a marker, to indicate the center of each implant and the desired angulation. This provides maximum freedom for implant placement, yet communicates the ideal tooth position and angulation during surgery. A surgical guide template with 2 mm holes through is too limiting for the surgeon, although it precisely identifies the ideal implant placement. When template is in position, the crest of the ridge should be visible to avoid stripping of the facial plate of bone during osteotomy. In the edentulous arch, the vacuum form may be fabricated from the existing removable prosthesis, if within accepted guidelines.

A soft tissue liner may then be added in the tuberosity or retromolar pad regions and other soft tissue areas not involved in surgery. Acrylic resin is then added over the occlusal portion of the stent where no implants are planned. The patient then occludes into this index after using petroleum jelly on the opposing teeth. In this manner the template may be correctly positioned over the edentulous ridge once the tissue is reflected. Otherwise, template position too far facial or off to one side is likely.

A surgical template for the complete edentulous arch may engage the occlusal aspect of the opposing teeth.

The fabrication steps on the edentulous cast mounted against the opposing dentition at the proper final occlusal vertical dimension and occlusal relationships given by.

Laney Poitras:

1. A full wax-up of the missing teeth in the edentulous regions is performed. a hole is prepared through the middle of the central fossa of each future posterior abutment tooth and through the incisal edge position of the anterior teeth
2. On the stone model ,each site chosen is drilled to a depth corresponding to the approximate soft tissue thickness measured on a panoramic radiograph (approximately 2-3mm). An orthodontic wire is passed through the teeth and into the holes. This allows each pin of the template to contact bone, once the tissue is reflected during the surgery, without modifying the occlusal vertical dimension and consequently the emergence position of the implant. A small loop is made at the other end of the wire to create a retention form. The wire should approach within 1-3 mm of the opposing arch
3. On the antagonist model painted with separator, an acrylic resin template is built on the occlusals that embed the retention loops of the indicator pins. Each pin must be embedded fully in the acrylic at the proper centric and vertical relationships



Once the soft tissue is reflected, the template is positioned over the teeth of the opposing arch. The patient may occlude on the pins, and each one determines the ideal center position of the teeth. A pilot drill can be used to mark each implant body position. The angulation of the osteotomy can also be determined by the template. This template may be used with a panoramic radiograph before surgery to determine vertical magnification or horizontal distortion

For Edentulous Patients:

The template may also be used at stage II uncoverty to find the position of each implant when soft tissue carving or fixed prosthesis type (FP-1) restorations are indicated, rather than complete reflection of the tissue.

A maxillary - anterior implant for a FP-1 and FP-2 result requires the more precise and ideal pretreatment planning and implant placement. The incisal edge of the crown, facial profile, and labial cervical position are all related to implant position. The ideal implant position results with a straight abutment directly under the incisal edge or slightly lingual to the incisal edge of the final crown for a cemented prosthesis. Screw-retained prostheses should have the implant

emerging more toward the cingulum of the anterior tooth so that the access hole does not affect the esthetics.

In an FP-3 restoration, the mesiodistal position of the implant abutments may be placed without regard to the actual placement of the crowns, because the soft tissue replacement region separates the crowns from the implant abutment. An implant placed adjacent to the natural tooth should remain 1-5 to 2 mm away from the interproximal cemento-enamel junction in esthetic regions, where the contour of the interdental papilla is the a determining factor. Therefore the pilot hole should be almost 4 mm away from the natural tooth to place 4.1mm diameter implant at the crest module. This requires atleast a 7 mm mesiodistal space.

In unesthetic regions, where the interdental papilla is not critical, an implant placed at least 1.5 mm away from the adjacent tooth minimizes the risk of surgical error and provides easier access for hygiene and long term maintenance.

A maxillary anterior implant placed for an FP-1 restoration requires the most careful pretreatment planning and precise implant placement. The incisal edge of the final crown, emergence profile, and labial cervical position

are related to implant position.

An implant in the maxillary first premolar position must consider mesial angulation when a natural canine is present. The 11-degree average distal inclination and distal curvature of the canine root places the apex of the root and first premolar implant in the same area. Therefore the implant should be angled to follow the root of the canine and prevent contact and/or perforation of the natural root. A shorter implant often is indicated especially when a second premolar is also present

At last it can be concluded that, surgical models and guidance have acquired a new dimension with the integration of CAD-CAM technology and computer -guided surgery. With the advent of low radiation cone beam CT, now available in small practical units, access to CT data is simplified and in turn, advanced diagnosis and fabrication of CAD-CAM surgical guides become more realistic. But due to cost-effectiveness and credibility in above modalities most clinicians use conventional methods. More evidence based researches still has to be conducted to evaluate the complete limiting design and its effect on final prosthesis.

Indian Prosthodontic Society: Uniting Hands for Community Services

A new campaign taken by Indian Prosthodontic Society towards community outreach program to reach maximum to the general population to create oral health awareness & to make them more aware towards this branch of dentistry as, the community based approach is method of active learning which involves integration of social sciences with medical domain, task-oriented and active community involvement. Dental camps are the most important way to maintain the health of the community. In our country major concern is to improve the oral health and ensure that basic dental facilities should be available to every section of society. As among the Indian population nearly 75% resides in villages thus oral health is neglected due to lack of awareness. Dental camps in India are conducted on routine basis.

A one day denture camp is a unique community program to deliver removable denture including complete denture or removable partial dentures for the masses at their doorsteps, free of cost, for the rural population. Conducting a successful camp, especially denture camps includes assembling the manpower, finance, materials, equipments, instruments, coordination and a team with a generous mindset. Through these camps, it is possible to rehabilitate more number of poor patients in a short span of time.

With these great thoughts in mind and doing something good for the society our Indian Prosthodontic Society under the dynamic leadership of Dr. Himanshu Aeran President Indian Prosthodontic Society took this pledge to serve the humankind by organizing series of such camps in different regions respectively.

Campaign 1: An excellent community outreach programme was organized by Indian Prosthodontic Society at Bijengere village in Raichur district between 16th to 20th Nov. Successfully. Total of 57 patients were screened in which 21 required complete denture, 36 requiring removable partial denture. Before beginning of the programme patients were educated about importance of Prosthodontic treatment and denture maintenance. Dentures were given by the chief guest Dr. D.N.S.V Ramesh, Principal, and Dr. Salim Dumbai, Adminstrator, AME's Dental College, Raichur Dr. Sunil Dhaded EC member, other staff with local social workers worked hard for the success of this camp.

Campaign 2: One more historical camp was organised by Indian Prosthodontic Society, Gujarat at a village near Greater Gir Forest by entire prosthodontic team of Ahmedabad Dental College & Hospital under the dynamic leadership of Dr. Darshana Shah on 18th -19th Jan, 16. Patients were screened for fabrication

of complete denture and out of those 105 patients who were completely edentulous were selected for denture camp. Teams were divided and places were selected for clinical work, lab work and plaster work. Successfully 105 Complete Dentures with satisfactory retention and stability were given in a day by 38 Doctors, 5 Technicians and 10 Auxiliary Staff which was supported by, Narmadaben Madhavray Savani Foundation.

Campaign 3: A one more denture camp in the series of this community outreach programme was organized by Indian Prosthodontic Society, Nagpur in collaboration with VSPM Dental College & Research Centre Nagpur at Matushri Vridasharam Adasa being run by Bhartiya Aadim Jati Sewak Sung Vidarb, Nagpur Society 35 kms away from Nagpur. 36 Complete dentures and 14 RPD's were delivered in 2 days i.e. 5th & 6th Feb, 16 to the needy patients to ashram and nearby areas. Dr. Himanshu Aeran President IPS visited the camp. He interacted with all patients & did some symbolic work to boost morals of working doctors. Dr. Usha Radke Dean VSPM & President IPS Nagpur, Dr. Harsh Arya Secretary IPS Nagpur, Dr. Anant Raj, Dr. Jayshree Joshi, PG students and interns worked hard for the success of this mega event of social service.

