

# Facial beauty ‘bone deep’

The mandible provides the foundation for a tight lower face. **Oscar M Ramirez MD** discusses how he inserts mandibular implants to redefine the jawline, especially effective with neck-tightening

**S**ize and shape of the facial skeleton affects how the soft tissues of the face are molded. The relationship between the bony framework of the face and its soft tissue envelope helps determine whether a face is unattractive or beautiful. The skeletal framework seems the most important in defining facial beauty.

Looking from another perspective, it seems that facial beauty is “bone deep”. This is a common observation among artists, plastic surgeons and photographers. Flicking through any glamour magazine, the most beautiful people—regardless of age and sex—are those who have strong orbital rims, nice cheek bones and a strong mandible and chin.

Facial ageing is also interdependent of the strength of the facial skeletal support. In other words, people with a stronger skeletal foundation seem to age more graciously and later in life. For those who do not have good support, all the soft tissues sag quicker and more severely. This is particularly true of the mandible, the framework of the lower face and, to a greater extent than previously appreciated, it exerts significant influence on the aesthetics of the neck.

## Adequate contour

I developed the Mandibular Matrix Implant System (MMIS) for implant manufacturer Porex Surgical. MMIS addresses the absence of adequate mandibular contour from the tip of the chin to the angle of the jaw (gonial angle). The system provides an excellent construct to redefine the jawline, especially when combined with a neck lift or neck tightening procedures.

MMIS is resistant to infection and has long-term stability, enabling rapid revascularisa-

tion and ingrowth of tissue. It can be fashioned to mimic the normal contour of the jawline. The multiple components of the implant system allow augmentation of the entire mandible or individual segments that may be deficient.

The implants have been designed to provide “three-dimensional” restoration of the

gonial angles can be combined with newer, different-shaped implants to accommodate different patients’ requests and aesthetic needs.

## Technique

The surgical technique for the insertion of MMIS has been refined since the early description in the mid-

a bone tunnel, and the extended chin implants are secured with titanium self-tapping screws in a bicortical fashion. Careful planning is necessary for placement of a submental incision. Augmentation of the bony symphysis will advance the soft-tissue envelope. This tends to rotate the submental incision anteriorly. Therefore, we typically place the incision 1–1.5cm posterior to the submental crease. By doing this, the incision remains hidden in the submental area.

The dissection is carried down through the subcutaneous adipose tissue to the level of the platysma. A thick subcutaneous dissection is then performed 2cm anterior and 2cm posterior to this incision. The platysma, mentalis muscle and periosteum are then divided in the midline perpendicular to the direction of the submental skin incision. A subperiosteal dissection is then performed in an anterior direction to the level of the mentolabial fold. This can be performed under direct visualisation with the aid of a lighted Aufricht retractor. Care must be taken to avoid perforation of the oral mucosa.

The dissection continues laterally to expose the entire anterior and inferior surfaces of the mandible. This dissection is facilitated by a #4 Ramirez elevator (Snowden-Pencer, Tucker, Georgia).

The mental nerves must be identified and carefully dissected free from the surrounding structures. However, this part of dissection around the nerve is done after the implant has been introduced. This way early protection of the nerve and avoidance of excessive retraction will prevent nerve injury.

The lateral dissection proceeds to the level of the anterior

caption or lewngnd text in here caption or lewngnd text in here caption or lewngnd text in here caption or lewngnd text in here caption or lewngnd text in here

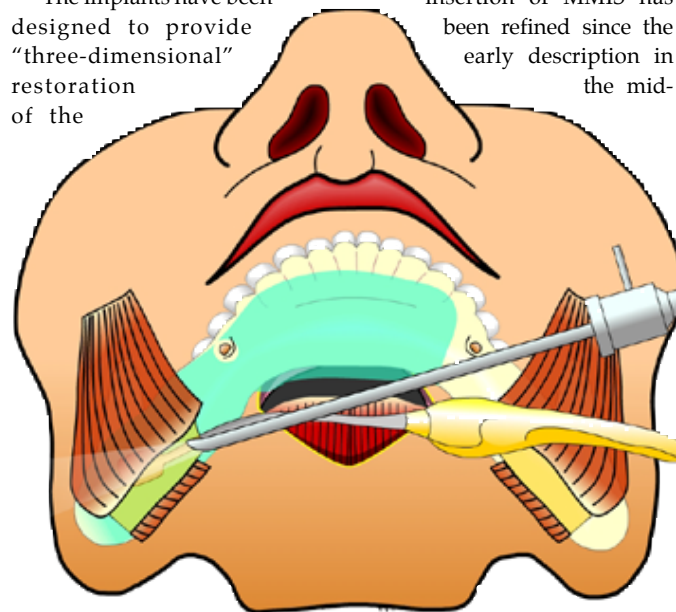
mandible. They wrap around the inferior border of the mandible, and because of this shape are self-stabilising and require minimal fixation with screws or sutures tunnelled in the bone. This is a significant advantage compared with two-dimensional onlay implants.

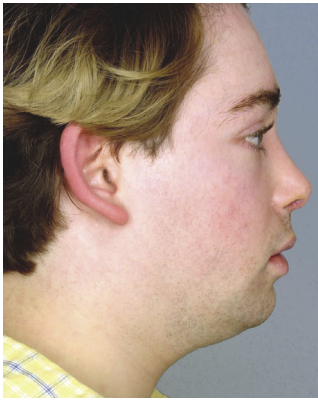
Despite its rigidity, the component system allows insertion of the implants to restore the entire mandibular contour through minimal access incisions. MMIS is composed of a two-piece extended wraparound chin implant and gonial implants made from high density porous polypropylene designed for the right and the left mandibular angles respectively. A prejawl implant can be included in this system when necessary. The

90s and published later (*Plast Reconstr Surg* 106: 176, 2000). General anaesthesia is recommended for all cases. When combined with adjunctive aesthetic procedures, MMIS should be placed as early as possible.

Access incisions should be closed immediately to prevent possible contamination. Retromolar and lower buccal sulcus incisions can be used for inserting the mandibular angle implants and extended chin implants respectively.

I place both the mandibular angle and extended chin implants through a single 3cm submental incision with the assistance of a 5mm endoscope. The mandibular angle implants are secured with a #2-0 polydioxanone suture passed through





*caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd*

border of the masseter muscle. This can be accomplished with the use of a small fibre optic lighted retractor. At this point, the 5mm endoscope is inserted and the subperiosteal dissection continues with the Ramirez-angled periosteal elevators.

Under endoscopic visualisation, the inferior aspect of the mandibular angle is freed from the tendinous periosteal attachments. The posterior border of the ascending ramous is cleared in a similar fashion.

The bony surface of the mandibular angle is then exposed sufficiently in anterior, inferior, and posterior directions to allow the insertion of the silastic mandibular angle implant seizers. The pterygomaxillary sling is elevated in continuity.

With the dissection complete, the cavity is irrigated with antibiotic solution followed by packing with neurosurgical pledgets soaked in diluted Betadine and epinephrine solution (1:3,000). The pledgets are left for several minutes to provide haemostasis and to improve visualisation of placing the implants with endoscopy. As stated previously, oral incisions can be used for the placement of the implant system. However, this may increase the incidence of bacterial seeding of the implant and development of early or late postoperative infection. Familiarity with endoscopy and access to the appropriate instrumentation will be key factors in the approach taken.

The mandibular angle and

extended chin implants have been developed with corresponding silastic sizers. The introduction of these sizers helps to choose the appropriate size of implant for each patient as well as to examine the contour of the jaw line.

After the implants have been chosen, based on the desired aesthetic contour and the appropriate fit, calipers are used to measure the distance from the midline to the mental nerves. These are translated to the extended chin implant, and the corresponding grooves on each side are made on the implants using a #10 scalpel and a cutting board.

This space created for the mental foramina prevents pressure neuropathy. Further carvings on the implants are made based on the assessment made by the appropriate sizers. At this point, the sizers are removed and the cavities are irrigated with antibiotic solution.

A smooth aesthetic plastic sleeve is then rolled into a conical shape and inserted into the

cavity. This sleeve isolates the implant from the skin surface and the deep tissues, creating a smooth protected surface for the rough porous polyethylene to slide against. Initially, the gonial angle implants are introduced and directed to the appropriate anatomical location under endoscopic guidance. The placement of the implant is further facilitated with the use of the periosteal elevators.

A bicortical hole is drilled into the inferior border of the mandible about 0.5–1cm in front of the gonial implant. Then using a #2-0 PDS suture, the anterior border of the implant is fixed into this predrilled bicortical hole. The wraparound shape of the mandibular angle implant prevents rocking and the anterior fixation is enough to help the implant to hug snugly into the gonial angle.

With the gonial angle implant secured, the extended chin implants are inserted in a similar fashion. A smooth plastic sleeve helps easy introduction. The extended chin implant is then positioned along the inferior border of the mandible.

Before fixing the implant in place, two things are checked:

- the position of the mental nerve in relation to the implant;
- the position of the lateral borders of the chin implant so that they are hugging snugly around the mandibular border and overlapping the more anterior border of the gonial angle implant.

If the implant is away from the mandibular border, then the anterior border is trimmed vertically to allow the rotational effect

and satisfactory fitting of the implant. When this is achieved, each half of the implant is fixed using bicortical titanium screws of 1.5mm in diameter and about 12–14mm in length.

Alternatively, if the aesthetic goal is different and the patient's anatomy varies, the gonial implant can be combined with prejawl implants to augment mostly the width of the chin. Other implants are the button chin implant, which gives a more anterior projection of the chin's most anterior portion as opposed to the standard RZ implants, which give significant width.

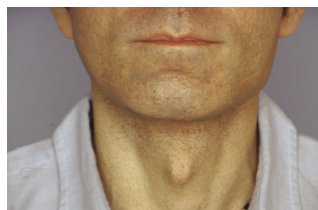
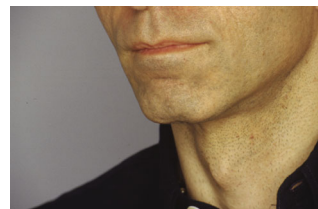
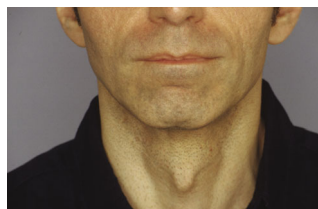
Before closure, the surgical cavity is irrigated again with antibiotic solution and two butterfly drains (one to each side) of about 1.5mm in diameter are introduced in a criss-crossed manner through small stab-wound incisions on the neck. The ends of the drains are placed over each angle implant and each one secured to the skin with a #4-0 PDS suture. The previously detached digastric muscles are sutured to the most anterior and inferior border of the chin implant to redefine the shape of the neck.

Further neck contouring can be done at this point to remove the deep subplatysma fat. The platysma muscle is closed in a vertical fashion with inverted #3-0 nylon sutures. This closure is continued over the chin pad in which the mentalis muscle was also split in the midline. This is closed with inverted #4-0 Prolene sutures.

The skin is closed in two layers using #5-0 Prolene sutures and the incision is protected with Bioclusive dressing to prevent tissue desiccation. A tight neck facelift-type of dressing is applied to reduce the swelling and provide space for fluid accumulation.

### Post-op

If only an MMIS has been performed, the patient can be discharged home under the care of a well-informed relative or practical nurse. The butterfly drains are attached to the vacuum tubes and changed periodically



*caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd*

## SURGERY

during the next 48 hours. We find that evacuation of this fluid minimises the amount of facial neck edema postoperatively.

A daily drain output of 20–30cc for the first two to three days should be expected on average. However, early on there is a more significant drainage, which is a mixture of blood and fluid that has been used for irrigation. The drains are advanced on the third postoperative day and, depending on the amount of drainage, this can be kept until the fourth or fifth postoperative day.

Antibiotics are started the day before surgery and continued for one week postoperatively. Steroids have not provided reduction of postoperative edema in our patients and are not routinely given.

The initial helmet type of dressing is changed for a fit cervicofacial garment. This minimises swelling and fluid collection. Sutures on the submental area are usually removed on postoperative day four or five.

The initial experience of using the open method, for which the intraoral approach was used, gave a rate of infection of about 5%. Since we started using the endoscopic techniques via the submental incision, we have not seen any case of infection.

Temporary neuropraxia of the marginal mandibular branch has been seen in about 3% of cases. Temporary numbness on the mental nerves has been seen in about 5% of cases, with one case of a prolonged nature that required changing of the implant around the mental nerves.

An apparent early unsatisfactory aesthetic outcome has been seen in about 30% of patients. But after the swelling and edema have subsided, some of these early concerns disappear.

About half of these initial unsatisfied patients require some sort of adjustments of the implants in terms of size. Among these, 30% thought that their implants were too large, 30% complained that the implants were too small, and



*caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd caption or legnd*

30% complained that the tip of the implants were too angular. After adjusting the size, most patients were satisfied with the final aesthetic outcome.

Based on our latest research on soft tissue-skeletal relationship of these implants, MMIS seems to provide a much larger ratio of soft tissue-skeletal augmentation than the sliding genioplasty or silicone implants. A conservative amount of

augmentation is what I recommend rather than trying to be aggressive, which many patients request. ■

*Oscar M Ramirez MD is clinical assistant professor, Johns Hopkins University School of Medicine, Baltimore, MD, and director of Esthetique Internationale, 2219 York Road, Suite 100, Timonium, MD 21093. Tel: (410) 560-7090; email: oscar@ramirezmd.com; website: www.ramirezmd.com*