Jaw Angle Implant

Surgical Technique written by Barry L Eppley, MD, DMD

The following material provides a clinical overview of the jaw angle augmentation process utilizing Implantech’s silicone jaw angle implants. This discussion will include the following:

1. Preoperative Consideration & Preparation
2. Incision & Pocket Dissection
3. Jaw Angle Implant Selection and Placement
4. Stabilization and Closure

I. Preoperative Consideration & Preparation

Controlling the size, shape and position of any facial implant is important in determining the overall final aesthetic outcome. Examination and evaluation of the patient’s mandible and lower face as well as the overlying soft tissue is paramount to appropriately selecting the necessary and anatomically correct implant.

On the day prior to surgery, patients are typically started on broad spectrum antibiotics for a total of 7 days (1 day prior, on day of surgery and for 5 days post surgery). Intraoperatively, intravenous antibiotics and dexamethasone are given. Prior to surgery, the patient is placed in the upright position and the precise jaw area to be augmented is outlined with marking pen. At this time, final decisions are made to anticipate implant size, shape and position. These drawings are to help patients understand how the jaw angle area will be augmented.

In general, profileplasty has always emphasized an endpoint by which the degree of chin augmentation has been determined. This does not apply to jaw angle augmentation as it is not a projecting structure. Jaw angle augmentation is primarily determined in the front and three quarter views where the amount of jaw angle width and whether any change in vertical jaw angle height is needed. The side view is helpful but only in determining the vertical height of the jaw angle. Preoperative computer imaging is essential is making these determinations in conjunction with patient input. Knowing whether the jaw angle needs it be lengthened is paramount as this determines what style of jaw angle implant is needed.

On the patient’s face draw the existing line from the inferior border of the mandible from the chin back to the jaw angles and around the angles. In essence draw the shape
of the preoperative mandible using its lower border up and around to the ear. With the patient clenching their teeth, locate the mass of masseter muscle protrusion over the jaw angle and mark an X in its midpoint near the inferior border. This can be used intraoperatively as a location point for percutaneous screw fixation if needed.

Choosing the correct jaw angle implant is crucial to achieving a good outcome. There are two basic designs of jaw angle implants that are available. They are widening and vertical lengthening jaw angle implants. While each one does a little of the other (a widening style can cause a little vertical lengthening and a vertically lengthening style will also provide various width), the style selection determines whether the patient’s natural mandibular ramus shape is maintained or changed.

2. Incision & Pocket Dissection

Jaw angle implants can be placed either through an intraoral or external approach. However the vast majority are placed through the mouth to avoid neck scars as well as the risk of facial nerve injury.

Prep: The External facial sterile prep is done in the usual manner. The intraoral tissues are wiped with betadine solution.

Anesthesia: A dilution of local anesthetic solution is prepared, using 1% Xylocaine with 1:100,000 epinephrine. One-half percent xylocaine with 1:200,000 epinephrine can also be used. The injection is placed along the planned intraoral mucosal incisions and down.

Allow for at least 5 to 10 minutes for the local anesthesia and vasoconstrictive effects of epinephrine to take effect prior to beginning the procedure.

Pocket Dissection: The internal approach utilizes a 3 to 4 cm long mucosal incision that parallels the oblique ridge of the mandibular ramus. This is done with a needle point electrocautery. It is important that this incision stays lateral to the depth of the vestibule so there will be good tissue available for closure. A cuff of mucosa and buccinator muscle should be left near the mucogingival junction. The cautery is used to go right down to the bounce of the lateral mandibular ramus.

Begin subperiosteal dissection with a small elevator and then switch to a bigger and wider subperiosteal elevator to lift off the tissues down to the inferior border both inferiorly and posteriorly. The subperiosteal pocket should follow the entire outline of the mandibular ramus from the coronoid notch superiorly, the lateral ramus posteriorly, and the lower border inferiorly. It is also important that the pocket dissection come anteriorly enough to accommodate the anterior extent of the implant. The most
The common reason for jaw angle implant malposition is inadequate pocket dissection.

With a widening jaw angle implant the pocket dissection is now complete as the implant is positioned over the existing jaw angle shape. With a vertically lengthening jaw angle implant style, further dissection is needed. Careful elevation of the tissues along the inferior border back to the jaw angle point is needed. This elevation must be done gently to avoid separating the pterygomasseteric sling and potentially causing a postoperatively elevated mastered muscle bulge when the patient clenches their teeth. Once back at the jaw angle strong tendinous attachments at the angle point will be encountered. These tendons must be released from the bone and this requires electrocautery to do so. Failure to release the jaw angle tendon will not allow a vertically lengthening jaw angle implant to be properly seated. Once the tendons are released the dissection continues along up the posterior ramus border.

With the subperiosteal pocket completed, the implant is ready for trying. To decrease the risk of infection it is preferred to use blue-colored implant sizers to make sure the pocket is of adequate dimensions. Once this is ensured, the permanent implant can then be placed in a single pass into the implantation site.

There are five golden rules that will help ensure safe and successful jaw angle enhancement surgery:

1. Stay on bone through the subperiosteal approach. This ensures a firm and secure attachment to the bony skeleton for the implant.
2. Elevate the soft tissues gently and avoid disrupting the pterygomasseteric sling.
3. Ensure the dissection space is slightly larger than the implant.
4. Make sure the pocket dissection matches the jaw angle implant style.
5. Leave an adequate soft tissue cuff on the vestibular side of the intraoral incision.

3. Jaw Angle Implant Placement

Once the pocket has been created, blue implant sizers can be utilized to determine the appropriate size of implant. This is especially helpful while becoming familiar with the various jaw angle implant styles and sizes. It can also be important to ensure that the pocket is large enough in all of its required dimensions. Pockets that are not adequate lead to the surgeon trying to jaw the implant into position. If the implant has to be forced into the pocket this is an absolute sign of inadequate pocket size.
Once the desired jaw angle implant is chosen, soak the implant in antibiotic solution for a few minutes. A suggested solution is 1 gram of Ancef or Bacitracin in 50 or 100cc of Saline. If the patient is allergic to Ancef or cephalosporins, use 50,000 units of Bacitracin powder.

The dissected pocket is irrigated with antibiotic solution (the same solution that is used to soak the implant).

The implant is grasped with a clamp and placed into the pocket in an L-shaped pattern of insertion. This means it is initially inserted with the vertical back portion turned horizontal to parallel the inferior border and then rotated 90 degrees once into the pocket. As the incisinal length is almost always smaller than the length of the implant, it requires implant rotation through the incision for easy insertion.

If the pocket is adequately dissected the implant should sit passively into its desired position. If not and it comes pushing back up through the incision or appears rotated inside the pocket, this is a sign of inadequate pocket dissection. Once the implant appears positioned, lift up its underside and check where it is sitting along the jaw angle bone edges. This is particularly important for vertically lengthening implants where the implant should extend beyond the actual edge of the bone. In widening jaw angle implants, the inferior edge of the implant should lie flush with the inferior border of the mandible.

4. Screw Implant Stabilization

While jaw angle implants can have successful aesthetic outcomes without screw fixation, its use can ensure that no postoperative implant malposition will occur. This is most important in vertical lengthening jaw angle implants where a portion of the implant is not on the bone and it must resist the forces of displacement caused by masseter muscle contraction.

The best method of jaw angle implant screw fixation is a percutaneous approach using 1.5mm self-tapping screws. The empty screwdriver is initially inserted through the skin using a 2mm incision made by a #11 scalpel blade. The screwdriver is pushed through the master muscle and periosteum until it enters the pocket site. It is then redirected and brought out the mouth opening. A 1.5 x 5mm screw is then attached to the blade and the screwdriver carefully withdrawn until it lies up to the desired screw placement site. Usually one screw is needed but two can be placed for optimal prevention of implant rotation. Once the screwdriver is removed the skin is closed with a single 6-0 suture. This will heal with no discernible scar.
5. Closure

After the implant is placed and fixated, the incision is closed. No closure is necessary for the periosteum. The muscle and mucosa are closed in separate layers with running 3-0 Vicryl.

At the conclusion of the case, the face is dressed with a Velcro chin strap for compression.