

Fixation in Endoscopic Forehead Plasty

Bioabsorbable screws are a simple and cost-effective method of obtaining stable and durable fixation of brow position in endoscopic forehead plasty without permanent hardware or the need for screw removal. The author describes a technique for using this method of fixation.

It has been said that in real estate the 3 most important factors are location, location, and location. Analogously, I believe that in endoscopic brow lifting, the important factors are fixation, fixation, and fixation.

My early enthusiasm for endoscopic brow lifting, in 1994, was driven by my desire to embrace a technologic advance—miniaturization of instrumentation and the use of video—and the new concept of “dynamic functional repositioning of the brows.”¹

Historically, my patients had 3 reservations about the traditional coronal lift procedure: length of the incision, sensory disturbance, and brow overcorrection. The endoscopic procedure addressed these objections, providing a “fresh” look and a subtle improvement without a drastic change in appearance. I was able to assure patients that incisions would be less extensive, sensory change minimal, and overcorrection unlikely. My patients immediately preferred the endoscopic procedure to the traditional coronal lift, and the number of brow lifts that I performed increased by 300%. In the years that followed, this procedure has produced good results with low morbidity.

Endoscopic brow lifts were initially performed without fixation or with products that provided temporary fixation, such as external bolsters, and/or Reston foam and Coban wrapping (3M Customer Centres, Canada). However, 2 problems developed. First, surgeons began reporting complications of scalp necrosis and alopecia related to external bolster fixation. Second, there was some unpredictability of long-term brow position: not all patients maintained the correction observed at the time of surgery. These factors made a persuasive case for a change in technique.

Removable metal screw fixation was not considered to be a viable option because many patients expressed reservations about this technique. The galea aponeurosis plication technique of Hamas,² which I adopted in November 1995, provided improved positioning of longer duration without local tissue problems.

However, it was difficult to judge the amount of overcorrection needed, inasmuch as this varied from patient to patient and there was some inconsistency in results.

It was apparent that some type of predictable stable fixation was required—but for how long? When does the periosteum adhere with enough tensile strength to resist brow depressor activity and gravity? Clinically, I observed some settling with short-term fixation methods for up to 8 weeks. Thus the key issue was not when the periosteum became *adherent* (the usual description is “in several days”) but when the fixation became *durable*. Subsequent laboratory studies supported these clinical observations³: moderate fixation was achieved at 6 weeks and complete healing at 3 months. Thus, clinical and laboratory evidence indicate that fixation is needed for substantially longer than 2 weeks postoperatively and quite probably for 2 to 3 months. Not only must the brows be repositioned, but that position must be maintained predictably; fixation must be stable and durable.

Permanent anchors with swaged sutures were rejected as both expensive and undesirable. In fact, many patients asked whether I would use “permanent or temporary metal screws” and expressed reservations about this method of fixation.

I adopted bone tunnel fixation,⁴ using 2 points of fixation and 3-0 PDS sutures, in February 1997. Results improved, showing minimal loss of brow position over time. The disadvantages of bone tunnels in the office setting are the requirement of a high-speed drill and the



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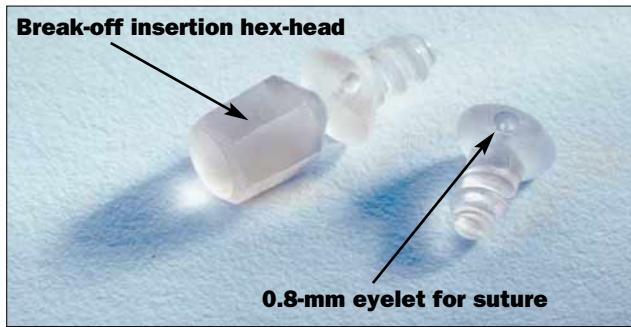


Figure 1. Lactosorb screws, made of Lactosorb resorbable copolymer, measure 2 × 5 mm.



Figure 2. Instrumentation for bioabsorbable screw fixation.

need to drill multiple holes in the outer table. In addition, sutures would sometimes break on a sharp bone edge when tied.

Bioabsorbable screw fixation with Lactosorb screws (Walter Lorenz Surgical, Jacksonville, FL) has been my preferred method of fixation for the past 18 months (Figure 1). These screws, which measure 2 × 5 mm, are made of PLLA/PGA-(Lactosorb Resorbable Copolymer), cost approximately \$40 each, and provide rigid, precise fixation without permanent hardware or the need for removal. The low (2-mm) head profile minimizes palpability of the screw, and the 3-mm thread length is within the usual measurements for thickness of the frontal calvarium. Similar products have gained wide acceptance in craniomaxillofacial surgery. Instrumentation is simple; a power drill is not required (Figure 2). The screw loses strength at 4 months and is not palpable postoperatively in most patients. It is technically easier to use these screws than to use bone tunnel fixation.

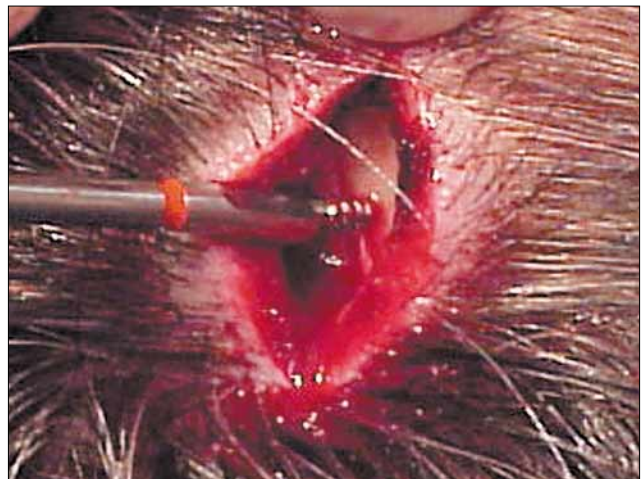


Figure 3. Hand tap used to make screw hole.

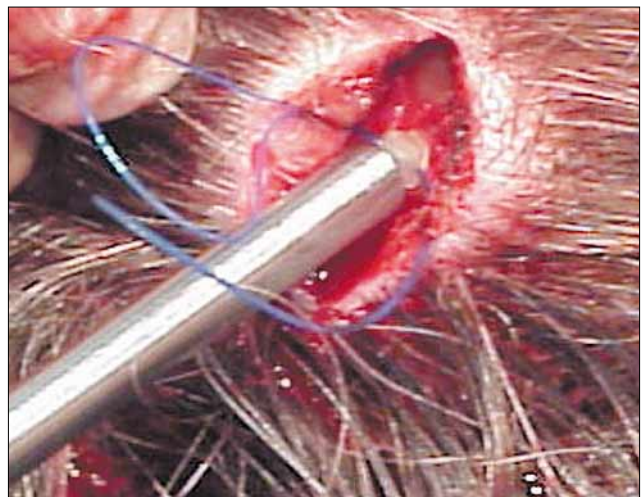


Figure 4. Inserting the screw. Note the threader (blue) through the hole in the screw. After the screw is placed, a suture is passed through the hole by means of the threader.

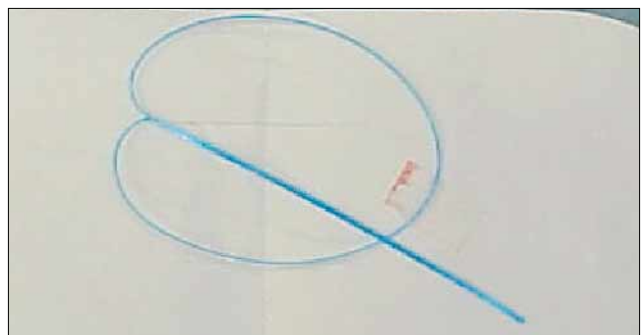


Figure 5. A threader device facilitates passing the suture through a small hole in the screw.

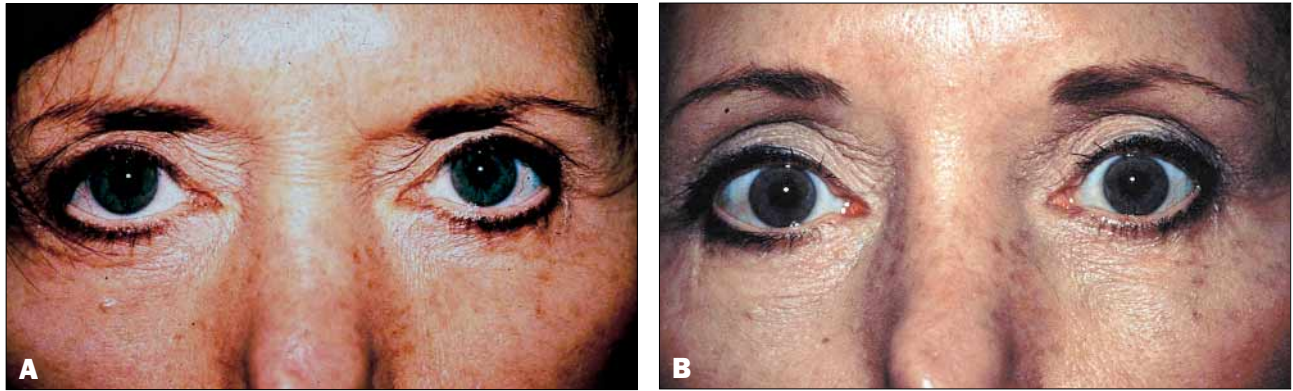


Figure 6. A, Preoperative view of a 62-year-old woman. **B,** Postoperative view 1 year after surgery.



Figure 7. A, Preoperative view of a 54-year-old woman. **B,** Postoperative view 18 months after surgery.

Using Bioabsorbable Screw Fixation

Access incisions for the procedure are planned along the appropriate vectors for brow elevation. One of the keys to accurate endoscopic brow positioning is full periosteal release along the orbital rims and spreading of the divided segments. After the surgeon completes the dissection and muscle modification, the self-drilling tap is used to drill and tap a hole in a single step; the screw is then easily inserted (Figures 3 and 4). A threader device, supplied with each screw package, facilitates passage of the suture (usually 3-0 PDS on a CT-2 needle) through a small hole in the screw, just beneath the head (Figure 5). The threader is passed halfway through the eyelet before the screw is inserted. After insertion, a suture is passed through the threader loop and delivered through the screw hole. Alternatively, a PS-1 or PS-2 needle (ETHICON, Inc., Somerville, NJ) can be passed directly through the eyelet hole.

A mattress suture bite is taken from the periosteum, galea, and subcutaneous tissues at the anterior end of the

incision. After all of the sutures have been placed, each is tied to produce the desired brow elevation. Elevation is obtained by adequate release; the sutures maintain the elevation until wound tensile strength is adequate. *The sutures do not pull the brow up but rather support its new position.* Fixation under tension will lead to relapse.⁵ If desired, 4-point fixation is easily achieved, the lateral screws being placed at or just lateral to the superior tem-

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poral line (the deep branch of the supraorbital nerve thus being avoided). Figures 6 and 7 show postoperative results in 2 patients.

Maintenance of a lateral open-eyed effect remains somewhat elusive; it relies on soft tissue fixation to counteract the downward pull of the orbicularis oculi. Improvement has been achieved by extensive release down to the lateral canthus and strong upward lateral fixation with two 3-0 PDS sutures on each side to the deep temporal fascia. ■

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