

STAPLES REVISITED

Robert M. Bernstein, M.D., New York, NY

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The Challenge

For a number of years Dr. Rassman and I used either metal staples or, more commonly, a running suture of Surgilene (or Nylon) to close the donor wound. However, neither type of closure was completely satisfactory.

Metal staples were uncomfortable and disliked by many patients and they often left a fine, but very distinct line in the donor area. On the other hand, Surgilene sutures (made of a non-absorbable, synthetic, mono-filament) were more difficult to remove. More importantly, when there was any wound tension, or if there was significant post-op edema, the running suture could strangulate follicles and result in localized hair loss around the suture line.

To minimize any potential loss of the hair that was incorporated within the running suture, we began to place the sutures closer to the wound edge. Although this minimized the amount of trapped hair, it also made the sutures even more difficult to remove, as they became buried within days after the procedure.

We tried using various absorbable sutures, such as Chromic and Vicryl, but these produced too much tissue inflammation. The fact that they did not need to be removed did not offset the increased risk of follicular damage from the inflammation.

A New Suture

At the American Academy of Dermatology Annual Meeting in 1997, Johnson and Johnson introduced a new absorbable suture called Monocryl. The suture, made of Poliglecaprone 25, a synthetic, monofilament suture was touted as being easy to tie, very strong and preserving most of its tensile strength for up to three weeks post-op. Most importantly, it was broken down by hydrolysis rather than needing an active inflammatory response of the body to degrade the suture. (1) This seemed to be the answer to our problem.

We started using 3-0 Monocryl in a running stitch, placing it relatively close to the wound edge. We quickly learned that 4-0 and even 5-0 was sufficiently strong to hold the entire wound together. With the finer sutures we could place the stitches as close to the wound edge as 1.5 mm and still obtain a secure closure. One of the tricks we learned was that advancing the suture on the surface rather than under skin (as surgeons traditionally did) had two advantages. It minimized the amount of suture that crisscrossed the follicles under the skin and allowed the clipped hair at the edge of the wound (that the suture did cross over on the surface) to keep the sutures from becoming buried too quickly – if at all. This new suture and suturing technique soon became our closure of choice.

The Study

To test the usefulness of this new technique, we conducted a bilateral controlled study comparing staples to the new Monocryl sutures. Although 4-0 sutures were used in the

study, we soon used the finer 5-0 as our work-horse diameter as this allowed the most precise control of the wound edges and the least tissue reactivity. The paper describing this, "A New Suture for Hair Transplantation: Poliglecaprone 25" was published in 2001. (2)

In the study, we made objective measurements on the dimensions of the resulting donor scars and took subjective responses from the patients in the study. The two groups were evaluated with regard to healing, post-operative discomfort, resultant surgical scar, and closure material preference.

The average scar width on the staples side measured 1.78mm compared to a 1.42mm on the sutures side. Fourteen of the 22 patients in the study preferred Monocryl for future procedures; one preferred staples and 7 had no preference. Of those that preferred sutures, post-operative discomfort from the staples and the inconvenience and occasional pain associated with their removal was responsible for their decision.

Based on this study, we began to use Monocryl sutures for the majority of our donor closures. However, we occasionally still used staples in select patients, particularly in those with very high hair density and loose scalps.

Results Revisited

One of the things we liked about Monocryl was that its tensile strength lasted about three weeks. We felt that this, in conjunction with better control over wound edge apposition, accounted for the finer scar. Although staples were generally removed at 7 to 10 days, it occurred to us that since the staples were inert, they might be left in longer, or at least some might be left in longer, particularly when the wound edges were closed under tension.

With this in mind, for patients with all but the loosest scalps, we began to remove alternating staples at 10 days and then the remainder at 18 to 20 days. At other times, we removed 2 of every 3 staples at the 10 day mark and the remaining 1/3rd at 18-20 days. This routine seemed to have two advantages. First, leaving in staples for a longer period of time seemed to result in a finer scar and second, we felt more comfortable allowing active patients to resume physical activities sooner after surgery. Of course, patients had the inconvenience of having the staples in longer and needed to return to our office twice for their removal.

It also occurred to us that perhaps there was a subtlety in the results of the original study that we had missed. Although the data showed that Monocryl suture produced a slightly finer donor scar than staples – on average 0.34mm, the look of the sutured closure was even harder to detect than would be predicted by this number alone. When one looks at the sutured incisions and compares it to the stapled closure, one notes a smudgier, softer, less defined line. In contrast the stapled closure is more defined and often more easily identified through hair.

The paradox is that the smudgy look of the sutured closure is due to the fact that a running suture actually destroys tiny bits of hair along its path. Thus, the very thing that made the sutured incision look more natural – focal, hair loss along the suture line – was the very problem we were trying to address, i.e. follicular damage. In other words, although the actual suture line produced by the Monocryl closure was fine, there was

some spotty hair loss from the suture making this line less distinct, but also causing a net loss of hair (albeit small). In contrast, the slightly wider scar of the staples represented a small amount of stretch (due to wound edges they were not as well apposed during the closure) rather than from the destruction of follicles.

Since the suture study, a new advance in wound closures has been described by Marzola, the Trichophytic Closure. Although initially used with sutures, it allows stapled closures to heal with a less detectable scar as well. Because it is slightly more difficult to control the wound edges with staples, in contrast to sutures, we have been experimenting with trimming both the upper and lower edges – but removing less tissue at each edge than if only one edge were trimmed. Regardless of the specific technique, the Trichophytic closure is one more argument in favor of returning to stapled closures.

Many patients, who have had both stapled closures and absorbable Monocryl sutures, have been adamant in requesting the sutures again, due to the convenience and comfort they provide. However, we feel that the potential to conserve donor hair outweighs any discomfort during the healing process and makes using staples worthwhile. After all, conservation of hair should be our ultimate goal.

In sum, although our 2001 study suggested a running Monocryl suture to be the preferred technique, the fact that sutures appear to destroy more hair and that newer stapling techniques can improve on the linear scar; stapled closures have become our closure of choice. Further controlled studies are needed to support these clinical observations.

References

1. Bezwada RS, Jamiolkowski DD, Lee I-Y, et al: Monocryl suture, a new ultra-pliable absorbable monofilament suture. *Biomaterials* 1995; 16: 1141-48.
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3. Marzola M. Trichophytic Closure of the Donor Area. *Hair Transplant Forum International* 2005; 15(4): 113, 116.