Wire Subcision for Complete Release of Depressions, Subdermal Attachments, and Scars

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Background: Deep lines, facial folds, retracted scars, and contour depressions on all areas of the body have typically been resistant to efforts at release.

Objective: A method using a wire dissector to achieve complete release or subcision of these subdermal attachments with access only through the needle insertion sites is described.

Methods: The wire dissector was inserted into the subcutaneous tissue just below the dermal–subcutaneous tissue junction and brought out of the skin on one side of the defect. The needle was then passed back and forth through the same puncture holes until the depression was circled entirely in the subcutaneous plane by the wire. Traction was applied by the assistant, and the wire was sawed gently back and forth until the depression was completely released.

Results: The areas most commonly treated with the wire were the deep nasolabial folds; among the other areas treated were marionette lines, cheek and chin lines, and retracted scars of the face and body. Of 38 patients treated, 27 underwent simultaneous fat injection, 1 received an AlloDerm (LifeCell Corp., Branchburg, NJ) graft, 1 received a Radiesse (Bioform Medical, Inc., San Mateo, CA) injection; and 1 received injection with Sculptra (Dermik Laboratories, Berwyn, PA). Eight patients had nothing placed under the subcision area. Follow-up of 1 to 19 months showed persistent correction in all patients. Postoperative complications included one hematoma, one localized abscess, and overcorrection in three cases where fat was used.

Conclusions: The wire dissector holds promise as a tool for complete subcision of deep lines, folds, depressions, and scars of the face and body without incisions and with few complications. (Aesthetic Surg J 2006;26:387–394.)

Facial lines, depressions, folds, and/or depressed scars on the body or face are typically treated with injectable fat, fillers (both synthetic and natural), or implantable grafts. Botulinum toxin injection as well as ablative skin resurfacing techniques are also adjunctive treatments for these soft tissue contour defects. However, many deep folds, wrinkles, lines, and scars are resistant to these modalities, whether used alone or in combination, because of the attachment of the depression to the underlying deeper tissue.

Attempts to release these subdermal attachments have been performed with needles, forked cannulas, and even direct excision. Failure to fully release subdermal attachments by these methods often leads to inadequate correction with suboptimal results. Attempts to elevate these tightly tethered areas with injectable fillers alone can lead to soft tissue augmentation around the defect, which in turn accentuates rather than corrects the depression.

This paper reports on a nonincisional method for complete “subcision” or subdermal release of deep facial lines, depressions, folds, and retracted scars on all areas of the body using the Diamond Wire (Nutec International, Tucson, AZ), the Surgiwire (Coapt Systems, Palo Alto, CA), and the Wire Scalpel (Prollenium Technologies, Richmond Hill, Ontario, Canada).

Materials and Methods

The Diamond Wire and Surgiwire both consist of a 7-strand braided wire with attached straight needles at both ends (Figure 1). The Wire Scalpel is a single-ended braided wire that is shorter than either of the other wires. The procedure can be performed with local anesthesia alone or in conjunction with other procedures under general anesthesia.

The needle with the attached braided wire was inserted into the subcutaneous tissue just below the dermal–subcutaneous tissue junction. It was brought out of the skin on one side of the defect. The needle and wire were then reintroduced through the site where the needle was brought out of the skin and brought out on the other side of the defect. They were then reinserted through the same puncture site and brought out at the original wire access site. By use of these maneuvers, the depression was
circled entirely in the subcutaneous plane by the wire. The wire was placed as close as possible to the line, wrinkle, or fold. The ends of the wire were crossed and traction was applied by the assistant while the wire was sawed gently back and forth until the depression was completely released, at which point the needle and wire were removed (Figure 2). A solution of 1% lidocaine with 1:100,000 epinephrine was irrigated into the undermined pocket and pressure was applied at the area of release to obtain hemostasis. Ice packs were applied and the patient was instructed to apply ice twice an hour for the next 4 hours and then as needed over the next 36 hours.

The puncture sites may be used as access points for fat grafting or injection of other fillers. Implantable grafts could be placed by slightly enlarging the access site. Injection of dermal fillers, as well as cutaneous ablative procedures such as laser resurfacing, chemical peel, dermabrasion, or Thermage, may be performed at the same time or as a later procedure.

**Results**

As of March 2006, 45 patients have undergone subcision of retracted areas of the face and body as well as tissue undermining in areas of the neck and legs. The longest follow-up has been 19 months, with a mean follow-up of 12 months. The most commonly treated areas have been the deep nasolabial folds with WSRs (Wrinkle Severity Rating Scale) of 4 or 5. Other treated areas included marionette lines, radial lip lines, cheek and chin lines, acne scars (Figure 3), glabellar lines, the labiomial crease, the corners of the mouth, transverse forehead lines, neck lines, and retracted scars of the face and body. Radial lip lines were released individually or collectively by inserting the diamond wire at the commissure and threading it under the white roll to exit near the midline. The needle was reinserted through the exit puncture site and threaded around the cutaneous origins of the radial lip lines to once again exit at the commissure insertion site. Care should be taken to limit the vertical extent of the undermining to no more than 4 mm to prevent prolonged swelling and the appearance of a long upper lip.

Excluding patients in whom the wire dissector was used to widely release the neck skin in the preplatysmal plane, 27 of the 38 patients underwent simultaneous fat injection, 1 patient received an AlloDerm (LifeCell Corp., Branchburg, NJ) graft, 1 received a Radiesse injection (Bioform Medical, Inc., San Mateo, CA), 1 underwent placement of Sculptra (Dermik Laboratories, Berwyn, PA), and 8 patients had nothing placed under the released area. Five patients also underwent simultaneous laser resurfacing (Figure 4). Ecchymosis and swelling persisted between 3 and 12 days after the wire subcision procedure.

Follow-up of 1 to 19 months on all facial fold and scar release patients has shown persistent correction with an improvement of at least 2 on the WSRS. In most cases, fat was placed under the released areas (Figure 5), but improvement occurred even in patients in whom fat was not used (Figures 6 and 7). In patients with wider, more diffuse areas of scarring, fat is usually necessary (Figure 8). In this series, the wire dissector was used in 4 patients with depressed scars of the breast, buttock, and thighs, respectively. Fat grafting was performed under the released area of the buttock (Figure 9) as well as in 2 patients with depressed scars of the thighs. A small AlloDerm graft was placed under the released periareolar breast scar (Figure 10).

All areas have maintained complete correction. One patient with congenital macrostomia correction had resis-
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Figure 3. Acne scar release.

Figure 4. A, Pretreatment view of a 36-year-old man. B, Posttreatment view 7 months after cheek acne scar release, fat injection, and laser resurfacing.
Figure 5. A, Pretreatment view of a 56-year-old woman. B, Posttreatment view 9 months after wire release of grade 5 nasolabial folds, with fat placed under released site.

Figure 6. A, Pretreatment view of a 56-year-old woman. B, Posttreatment view 16 months after release of nasolabial folds, radial lip lines, and glabellar lines without fat injection.
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Figure 7. A, Pretreatment view of a 46-year-old man. B, Posttreatment view 8 months after nasolabial fold subcision alone without fat.

Figure 8. A, Pretreatment view of a 65-year-old woman. B, Posttreatment view 9 months after wire subcision and fat grafting to diffuse areas of facial depression from lipoplasty.
Figure 9. Release of buttock depression.

Figure 10. Release of periareolar scar depression.
tant left facial depressed scars with previous failed attempts at fat grafting and Alloderm graft placement. Release of the tethered scars and placement of fat grafts under the released scars has corrected the retractions (Figure 11).

Postoperative complications included 1 small hematoma, a localized abscess, and overcorrection in 3 cases where fat was used. Overcorrection was treated with massage and later by conservative local steroid injection if the area failed to respond to massage alone. Restylane (Medicis Aesthetics, Scottsdale, AZ) was also injected in 1 patient at the margin to feather in the transition between the overcorrected nasolabial fold and the adjacent cheek.

Discussion

Facial contouring can be said to follow the “R’s” of rejuvenation: refill, relax, resurface, redrape, retighten, and now: release. Previous attempts at release with forked cannulas or needles have proven inadequate in obtaining complete subcision of deep lines, folds, depressions, or retracted scars. Larger access incisions in the face or body to allow scissor dissection leave unnecessary and multiple scars. Access for the subdermal threading of the Diamond Wire is achieved through the attached needle puncture sites alone. These puncture sites also provide access for blunt-tipped 18-g fat injection cannulas.

Sulamanidize et al treated 54 patients with Wire Scalpel subcutaneous dissection without placement of fat graft or other fillers, with follow-up from 2 months to 4 years (mean, 11 months). The authors reported “good” and “satisfactory results” in 79.7% and 16.6% of patients, respectively, based on patient satisfaction surveys and patient and physician photographic evaluation.

In my present series, 27 of 38 patients received harvested fat grafts, 1 received AlloDerm placement, 1 received Radiesse, and 1 patient received placement of Sculptra under the released area. Empirically, it makes sense to place a filler graft to serve as a spacer to prevent deep reattachment of the released area. In fact, overcorrection occurred in 3 of the simultaneous fat grafting patients. Therefore, care should be taken to place just enough fat graft to form a smooth layer between the released dermis and the subdermal layers. In the 8 patients in this series, and in the 54 patients in the Sulamanidize et al study, “good” and “satisfactory” results were obtained without any graft material placed

Figure 11. A, Pretreatment view of a 58-year-old woman. B, Posttreatment view 14 months after release of nasolabial folds, macromastia repair scars, and fat injection.
under the released sites. It would appear that the normal processes of wound healing alone under the release sites can maintain the elevated lines, scars, or depressions. Additionally, if the defect would benefit from further correction after the area has healed from subcision, it would be much easier to inject a filler without battling the tight adhesions to the deeper soft tissue. The success of the buttock depression release with fat grafting suggests that wire dissection may be a useful tool for treatment of cellulite. The complete release of the dimpled areas through puncture sites would also allow more precise fat grafting with smaller 18-g cannulas.

Conclusion

The use of wire dissectors allows for complete subcision of deep lines, folds, depressions, and scars of the face or body through only puncture access sites. Simultaneous fat grafting can be used as a spacer to provide additional thickness and prevent deeper reattachment of the released area. In patients who do not undergo simultaneous fat grafting, I would recommend re-evaluation after at least 6 weeks and injection of a synthetic filler as a supplement at that time if necessary.

The wire dissectors also hold promise as a tool for the release of larger areas to be undermined, such as the neck and face, without incisions, and therefore is a promising tool for future minimally invasive procedures.

References


Dr. Graivier has received no financial backing from Nutec International but is part of a patent application for the Diamond Wire. He is also a consultant for Coapt Systems and is on its medical advisory board.

Accepted for publication March 20, 2006.
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Copyright © 2006 by The American Society for Aesthetic Plastic Surgery, Inc.
1090-820X/$32.00
doi:10.1016/j.asj.2006.05.004