Surgical Technique for Remodelling Lip Deformities Due to Overinjection of Silicone Oil

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BACKGROUND The injection of large volumes of silicone oil for lip augmentation can lead to the formation of abnormally prominent or projected lips. Conservative treatment measures are largely ineffective. This observational study describes the application of a surgical technique developed at our center for the correction of silicone oil–induced lip deformities.

PARTICIPANTS AND METHODS Fifty-nine patients presented at a tertiary medical center over a 6-year period with complaints of lip deformities caused by injections of silicone oil for lip augmentation 2 to 4 years previously. All had proven refractory to conservative treatment. The patients underwent individually tailored surgery consisting of a series of wedge-like incisions and Z-plasties to reproduce a normal lip line.

RESULTS Patients returned to their normal daily routine after 3 to 7 days. Only two patients (3.4%) required revision surgery after 6 months to correct lip asymmetry. Ninety percent of the patients expressed satisfaction with the aesthetic and functional outcome after 3 months.

CONCLUSION Our innovative, individually tailored surgical technique for the correction of lip deformities due to silicone oil injection for lip augmentation is simple and safe to perform and yields a satisfactory outcome in most cases.

The authors have indicated no significant interest with commercial supporters.

Lip augmentation is emerging as a sought-after procedure in cosmetic surgery. Lip volume can be increased using surgery or injectable fillers. Surgical options include the formation of a local flap, advancing tissue from the inner cheek toward the lip, or various V-Y flaps[1,2] or insertion of an autologous, heterologous (e.g., AlloDerm, Life-Cell Corp., Branchburg, NJ),[3,4] or alloplastic (e.g., polytetrafluoroethylene and Gore-Tex) graft.[5–7] Injectable fillers may be absorbable, such as hyaluronic acid and collagen, or nonabsorbable, such as silicone oil, methacrylate, and polyacrylamide.[8,9]

Silicone oil injection into facial tissues was popularized in the United States in the 1960s and 1970s with the introduction of medical-grade silicone (MDX4—4011) by Dow Corning.[10] Multiple authors have reported more than 17,000 facial treatments with silicone oil.[11] In 1992, because of safety concerns, the Food and Drug Administration (FDA) banned the use of silicone oil for cosmetic purposes, but it became available again 2 years later when it was approved for intraocular injection in the treatment of retinal detachment.[11] In 1997, the FDA Modernization Act allowed the off-label administration of silicone oil for soft tissue augmentation.[12]

For lip augmentation, silicone oil is injected in the form of micro-droplets into the vermillion border and lips at various points under the skin. Over time, fibroblasts produce new collagen that grows around the droplets, localizing the material. The consequent development of fibrous tissue (over several months) gradually augments the lips.[10,13]

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Silicone oil, like other permanent fillers (Artecol, BioAlcamid, Brindisi, Italy), poses a risk of deformity and complications.[14] Although the encapsulated silicone oil cannot migrate into the surrounding tissues, in some cases, collagen continues to be produced around the injected material, leading to the formation of a firm nodule. Fulton and colleagues[11] reported that of 608 patients who underwent lip augmentation with silicone oil injections, 2% acquired a palpable silicone granuloma. Histologic studies reveal an even higher prevalence.[15] Because the augmentation is not due to the silicone itself but to the collagen formed as a consequence of its presence, the injection of large volumes of silicone oil over a short time can lead to the permanent development of an abnormally prominent or projected lip.

The main method currently available for the treatment of lip deformities caused by silicone injections is local injection of steroids,[15] but the success rate is low. To counter this problem, our team developed an innovative, individually tailored surgical remodeling technique for use in these specific cases. The aim of this observational study is to describe our technique and evaluate its effectiveness in patients who presented at our clinic with silicone oil–induced lip deformities over a 6-year period.

Material and Methods

From January 2005 through October 2010, 59 patients presented to the Department of Plastic and Reconstructive Surgery of a tertiary medical center with complaints of lip deformities caused by lip augmentation procedures with silicone oil. All were treated using the surgical technique developed by our team. All patients provided written informed consent for the procedure.

Technique

Preoperatively, patients were prescribed oral valacyclovir 500 mg twice daily (to prevent herpes virus infection) and amoxicillin and clavulanic acid 875 mg twice daily (to prevent bacterial infection). Just before surgery, the lip mucosa were carefully marked in front of a mirror, with the patient upright, so that he or she could indicate the desired lip width (Figure 1). General or local anesthesia was then administered, followed by injection of a solution of 2% lidocaine hydrochloric acid and epinephrine 1:100 000 to constrict the vessels and reduce local pain postoperatively. A series of wedge-like incisions were made, ranging from longitudinal spindles to straightforward excisions of lumps or granulomas, to reproduce a normal lip line. The amount and symmetry of the local tissue determined the angle of the wedges (Figures 2, 3). we used at least two Z-plasties for all incision lines, depending on the length of the scar (Figure 4).

Figure 1. Male patient with hypertrophic lips due to silicone oil injection. Desired upper and lower lip lines are marked in ink on the mucosa preoperatively.

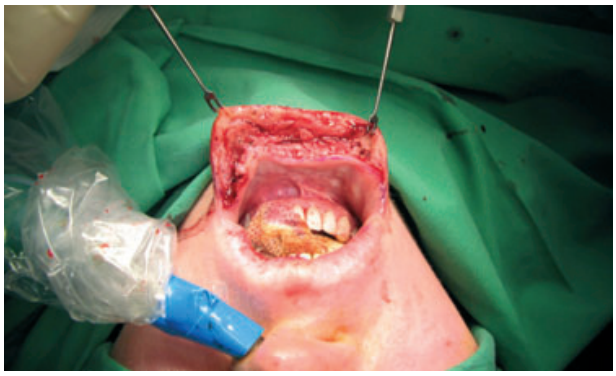

Figure 2. Lower lip reduction procedure after excision of excess tissue.

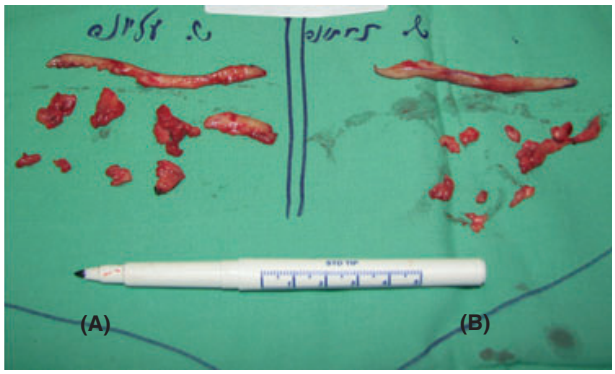

Figure 3. Excised lip tissue: (A) upper lip, (B) lower lip.

This was intended to prevent scar contracture, which can limit mouth opening. After meticulous hemostasis, the wound layers were sutured with polyglactin 910 5–0 and 4–0 sutures.

The postoperative treatment regimen consisted of intermittent topical application of cold compresses to the lips for 48 h. Patients were instructed to continue antibiotic and antiviral treatment for 5 days and to limit their diet to cold foods for 3 days. We suggested that, after approximately 7 days (time to absorption of the stitches), they perform gentle pursing (whistling) movements to gradually regain lip function, although they were to abstain from applying lipstick, kissing, and oral sex for 2 weeks. To soften and lengthen the scar, we suggested that they stretch their lips manually starting on day 21 after surgery (Figure 5).

Figure 5. Male patient manually stretching lips after lip-reduction procedure.

Patient Satisfaction

Patients were asked to complete a written satisfaction questionnaire at each monthly follow-up visit for a period of 6 months.

Results

The observed group included 48 women and 11 men aged 20 to 65. Most had undergone several sessions of silicone oil injection at short intervals (3–4 weeks apart). The time from the initial lip augmentation to appearance of the deformity ranged from 2 to 4 years. The main defects observed were overinjected "hypertrophic" lip, lip asymmetry, and lumps. Hypertrophic lips were characterized by an overinjection above the lip (duck beak), below the lip (chimpanzee lip), or both.

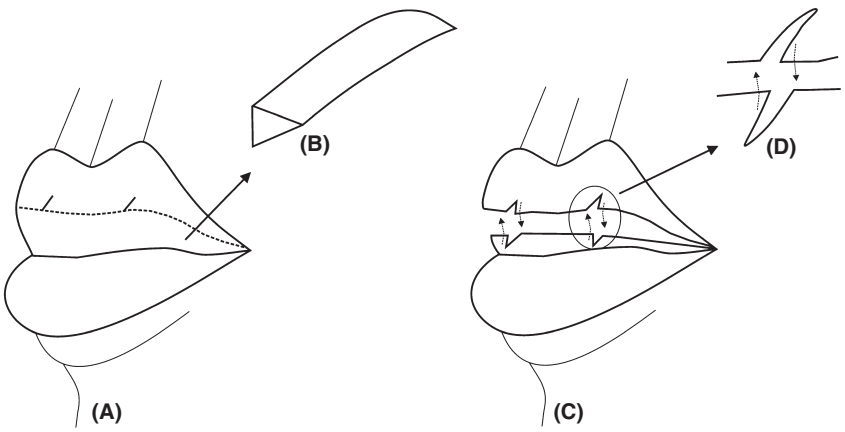

Figure 4. Diagram showing the surgical procedure on the upper lip: (A) preoperative lip marking, (B) wedge-like excision, (C) closing upper lip after excision, (D) Z-plasty.

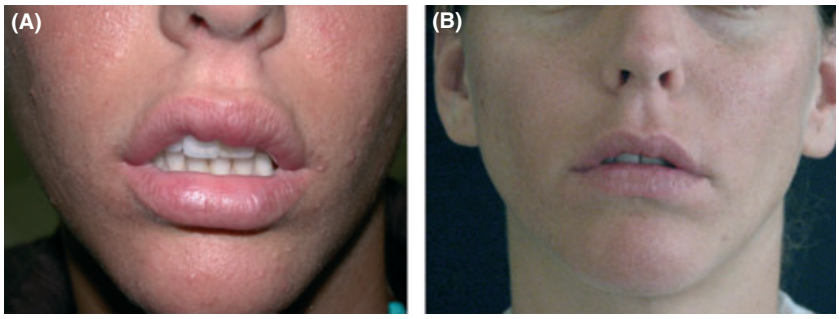

Figure 6. Female patient with hypertrophic lips due to silicone oil injection: (A) before treatment, (B) 1 year after surgical treatment.

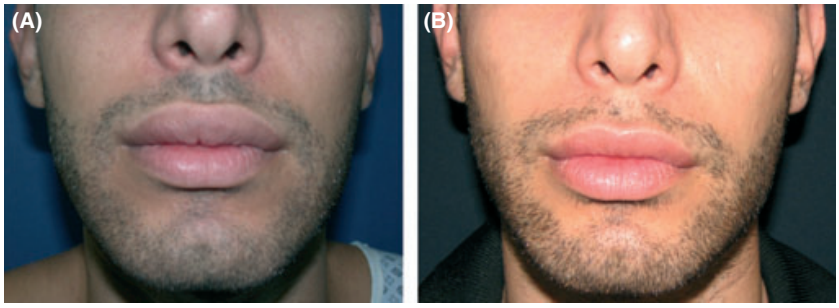

Figure 7. Male patient with hypertrophic lips due to silicone oil injection: (A) Beore treatment, (B) 1 year after upper lip surgical treatment.

Examples of the surgical outcome of our lip-remodeling technique are shown in Figures 6 and 7. Postoperative complications were minor, consisting mostly of swelling and ecchymosis. Patients returned to their normal daily routine after 3 to 7 days.

The Z-plasties, as expected, caused asymmetry along the stitch line due to early postoperative edema, but this resolved after 2 to 3 months. In some cases, a visible scar, asymmetry, numbness, or hypersensitivity of the lips was noted over the long term. After 6 months, revision surgery was performed in two patients (3.4%) to correct lip asymmetry.

At the first-month follow-up, approximately 50% of the patients expressed satisfaction with the aesthetic and functional outcome of the procedure. At 3 months and thereafter, this rate rose to 90%.

Discussion

Steroid treatment of silicone oil–induced lip deformities is often ineffective because steroids suppress the action of the collagen-producing fibroblasts but have no effect on the mass itself, leaving the filler intact. Furthermore, steroid treatment is applicable mainly for small or strictly localized problems, because in most cases, the silicone granulomas become part of the surrounding tissues. Other treatment options, such as suction, have also yielded largely unsatisfactory results.[16]

Most of our patients had lip deformities caused by the injection of silicone oil several years previously and had failed to respond to conservative measures.

To correct the deformities, we applied an individually tailored surgical technique consisting of a combination of wedge-like incisions and Z-plasties.

Our success rate was high; 90% of patients expressed satisfaction with the aesthetic outcome after 3 months, and only 3.4% of patients required revision surgery after 6 months. The jump in the satisfaction rating from 1 to 3 months was probably attributable to absorption of the edema, softening of the scar, and return to normal lip movement and function by the later time point.

In conclusion, our surgical remodeling procedure for lip deformities caused by silicone oil injections is simple and safe. It causes minimal discomfort to the patient, and the aesthetic and functional outcome is satisfactory. In many cases, surgery is the only effective solution for this problem.

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