

Treatment of Skin Depression with Combined Upward Suture Traction and Percutaneous Subcision

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Background: Scar retraction and soft-tissue depression may compromise aesthetics and cause social embarrassment. The purpose of this study was to evaluate the results of treating soft-tissue depressions or retractions at varied anatomy regions with combined upward suture traction and percutaneous subcision.

Methods: There were 40 patients (age: mean, 39 years; range, 22–55 years; 39 women and 1 man) (total, 77 soft-tissue lesions) who had treatment with the present technique from 1996 to 2013. Postoperative follow-up was from 6 months to 2 years. The treated anatomic areas were evaluated in 5 groups: (1) face (8 patients; 8 lesions); (2) gluteal (16 patients; 46 lesions); (3) breast (7 patients; 10 lesions); (4) abdomen (7 patients; 7 lesions); and (5) lower limb (2 patients; 6 lesions). The technique included placing a 2-0 nylon monofilament suture deep at the core of the depression, pulling vertically up with the suture, and using a needle or miniblade (placed percutaneously or through a small incision) to release the adhesions.

Results: The depressions were released successfully in all patients. Bruises around treated areas persisted for 2–3 weeks. Moderate induration persisted until 3 months. In the gluteal region, 6 patients who had retracted areas with diameter >5 cm developed seroma after treatment; the seromas resolved after needle aspiration or placement of a Penrose drain for 2 weeks (2 patients).

Conclusion: The present results confirmed the efficacy of the combined subcision method with upward traction at diverse body sites as previously reported for inverted nipple in the breast. (*Plast Reconstr Surg Glob Open* 2015;3:e534; doi: 10.1097/GOX.0000000000000486; Published online 14 September 2015.)

There are many causes of scar retraction and soft-tissue depression including infection, tissue necrosis after injections, breast radiation therapy, trauma, tumor excision, and gynecoid

lipodystrophy. The soft-tissue changes compromise aesthetics and may cause social embarrassment.

In a previous report,^{1,2} we described combined upward suture traction and percutaneous subcision to treat inverted nipple grade I and II. In this approach, the nipple is pulled up vertically with sutures and the retracted bands were released using 16- and 18-gauge needles that are placed percutaneously at the areolar border. During healing, the space created is progressively filled with connective tissue, with improvement of nipple anatomy.

We used the same technique to treat different soft-tissue depressions and retracted scars at multiple body sites. With this approach, the retracted zone was pulled vertically with looping sutures to

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Received for publication July 6, 2015; accepted July 17, 2015.

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DOI: 10.1097/GOX.0000000000000486

Disclosure: The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.

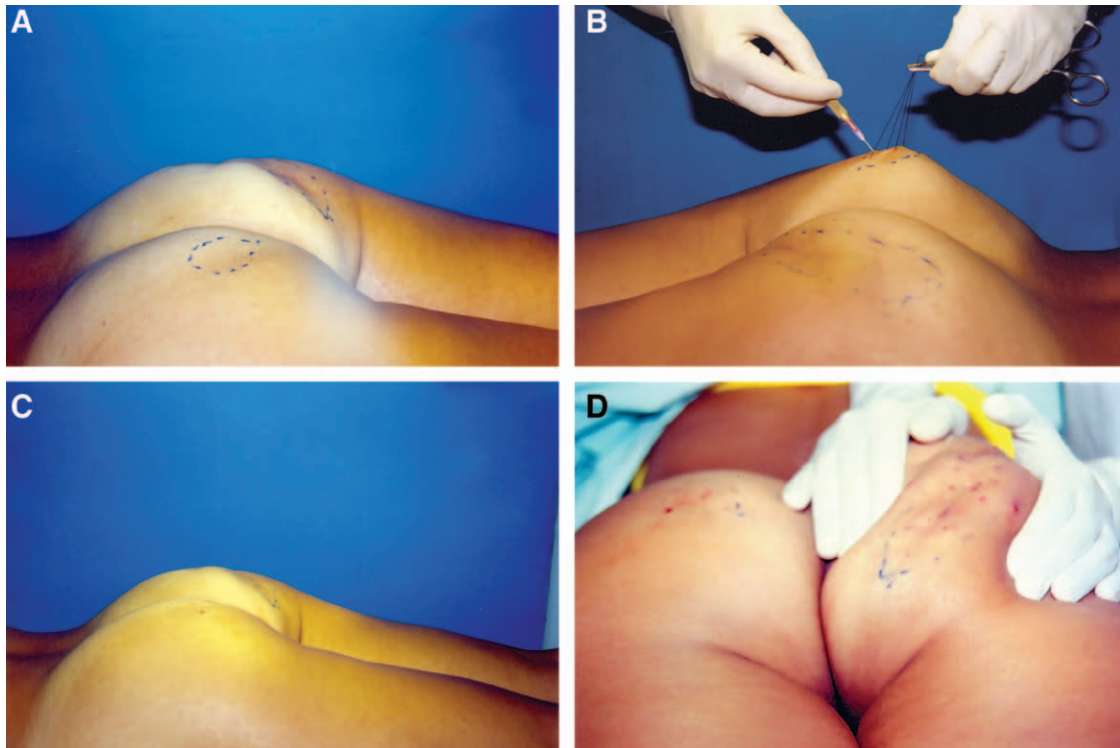


Fig 1. A 32-year-old woman treated for gluteal skin depression with the technique of combined upward suture traction and percutaneous subcision. A, Intraoperative view showing type 1A (subcutaneous lipoatrophy) of the left buttock and type 1B (fibrosis) of the right buttock caused by abscess during childhood. B, Upward traction of the adhesion with looping sutures placed in a crisscross fashion. The BD 18G pink needle is inserted in the deep plane through the external border of the type 1A depression. C, Improvement of the buttocks contouring at the end of the procedure. D, Palpation maneuver to confirm the releasing of the retracted bands.

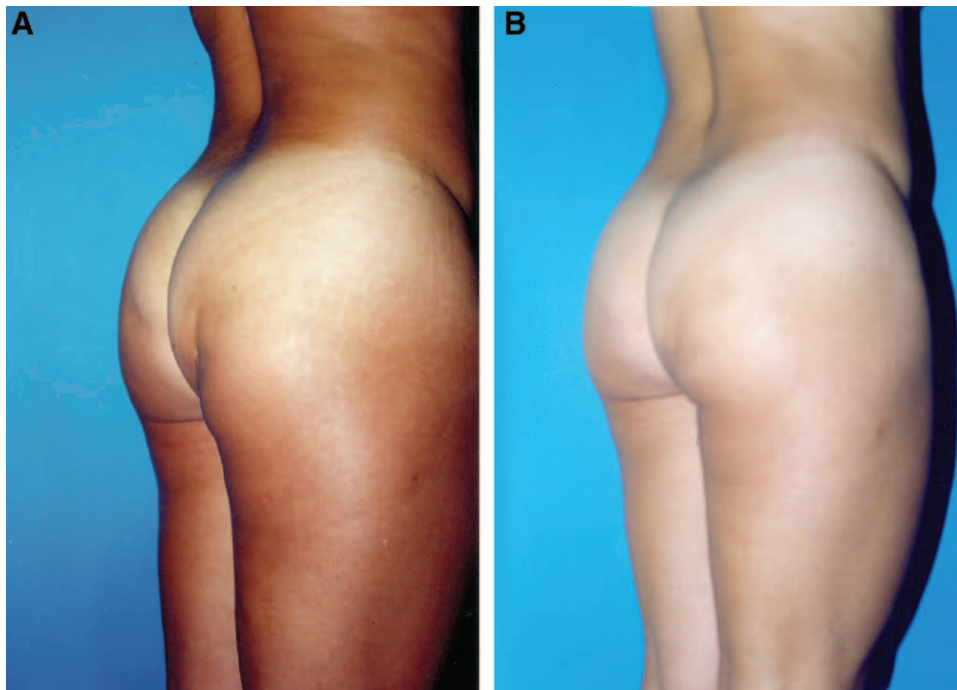


Fig. 2. Patient from Fig. 1 at 14 months after surgery. A, Preoperative view shows depression type 1A (lipoatrophy) at the left buttocks and type 1B (fibrosis) at the right one. B, Postoperative view shows improvement of the buttocks anatomy.

Table 1. Clinical Cases—Type of Lesions, Topography, Sessions, *n* = sites, Follow-up, Result

Case	Age; Sex	Topography	Session	<i>n</i>	Complication	Follow-up	Result
Group 1: Face = 8 patients (<i>n</i> = 8)							
1	40; female	Mandibular scar post alveolar abscess	1×	<i>n</i> = 1	None	Uneventful	Good
2	52; female	Alar retraction post rhinoplasty	1×	<i>n</i> = 1	None	Uneventful	Fair
3	50; female	Mandibular scar post alveolar abscess	1×	<i>n</i> = 1	None	Uneventful	Good
4	46; female	Mandibular scar post alveolar abscess	1×	<i>n</i> = 1	None	Uneventful	Good
5	40; female	Mandibular scar post alveolar abscess	1×	<i>n</i> = 1	None	Uneventful	Fair
6	40; female	Mandibular scar post alveolar abscess	1×	<i>n</i> = 1	None	Uneventful	Good
7	52; male	Mandibular scar post alveolar abscess	1×	<i>n</i> = 1	None	Uneventful	Poor
8	48; female	Mentonian scar post metacril + inflammatory reaction → 2 sessions + 2× fatgraft	3×	<i>n</i> = 1	None	Uneventful	Good
Group 2: Gluteal = 16 patients (<i>n</i> = 45)							
9	32; female	1B retraction post abscess	<5 cm 1×	<i>n</i> = 1	None	Hardness	Good
10	22; female	1B retraction idiopathic	>5 cm 1×	<i>n</i> = 2	Seroma	Ambulatory drainage	Good
11	36; female	1A retraction idiopathic	>5 cm 3× + FG	<i>n</i> = 2	Seroma	Ambulatory drainage	Good
12	30; female	1A retraction idiopathic	<5 cm 1×	<i>n</i> = 1	None	Uneventful	Good
13	38; female	1A retraction idiopathic	<5 cm 1×	<i>n</i> = 1	None	Uneventful	Good
14	36; female	1B retraction post injection	<5 cm 3× + FG	<i>n</i> = 4	None	Uneventful	Fair
15	40; female	1A circular depression	>5 cm 2×	<i>n</i> = 2	Seroma	Ambulatory drainage	Fair
16	48; female	1B retraction (post traumatic)	>5 cm 1×	<i>n</i> = 1	Seroma	Ambulatory drainage	Good
17	30; female	1B retractions grade 3 cellulite	<5 cm 2×	<i>n</i> = 6	None	Uneventful	Good
18	50; female	1B retraction (post tumor resection)	>5 cm 1×	<i>n</i> = 1	Seroma	Ambulatory drainage	Good
19	40; female	1B retractions grade 3 cellulite	<5 cm 2×	<i>n</i> = 4	None	Uneventful	Fair
20	38; female	1B retractions grade 3 cellulite	<5 cm 2×	<i>n</i> = 7	None	Uneventful	Fair
21	26; female	1B retractions grade 3 cellulite	<5 cm 2×	<i>n</i> = 5	None	Uneventful	Fair
22	50; female	1B retraction (fibrotic)	>5 cm 1×	<i>n</i> = 1	Seroma	Ambulatory drainage	Good
23	32; female	1B retraction (fibrotic)	<5 cm 1×	<i>n</i> = 3	None	Uneventful	Good
24	26; female	1B retraction (fibrotic)	<5 cm 1×	<i>n</i> = 4	None	Uneventful	Good
Group 3: Breast = 7 patients (<i>n</i> = 10)							
25	50; female	Postmastectomy retraction	1×	<i>n</i> = 1	None	Uneventful	Fair
26	40; female	Mastectomy axillary retraction + fat graft	2×	<i>n</i> = 1	None	Uneventful	Good
27	55; female	Mastectomy axillary retraction + fat graft	3×	<i>n</i> = 2	None	Uneventful	Good
28	38; female	Breast abscess retraction + fat graft	2×	<i>n</i> = 2	None	Uneventful	Good
29	50; female	Mastectomy retraction + fat graft	2×	<i>n</i> = 1	None	Uneventful	Fair
30	51; female	Mastectomy retraction + fat graft	2×	<i>n</i> = 1	None	Uneventful	Poor
31	28; male	Postgynecomastia retraction + fat graft	1×	<i>n</i> = 2	None	Uneventful	Good
Group 4: Abdomen = 7 patients (<i>n</i> = 7)							
32	30; female	Cesarean scar depression	1×	<i>n</i> = 1	None	Uneventful	Good
33	50; female	Scar drain site post laparotomy	1×	<i>n</i> = 1	None	Uneventful	Good
34	45; female	Scar drain site post laparotomy	1×	<i>n</i> = 1	None	Uneventful	Good
35	20; female	Abdominoplasty scar depression	1×	<i>n</i> = 1	None	Uneventful	Good
36	28; female	Abdominal scar depression	1×	<i>n</i> = 1	None	Uneventful	Good
37	28; female	Cesarean scar depression	1×	<i>n</i> = 1	None	Uneventful	Fair
38	35; female	Cesarean scar depression	1×	<i>n</i> = 1	None	Uneventful	Fair
Group 5: Lower Limb = 2 patients (<i>n</i> = 7)							
39	26; female	Orthopedic surgery scar; combined subcision	1×	<i>n</i> = 6	None	Uneventful	Fair
40	24; female	Thigh; posttraumatic scar	1×	<i>n</i> = 1	None	Uneventful	Good

FG, fat graft

provide traction, and the retracted bands were released percutaneously with circular motions using needles or miniblades.

The purpose of this study was to evaluate the results of treating soft-tissue depressions or retractions at varied anatomic regions with this percutaneous

or minimal incision method combined with upward traction with looping stitches.

PATIENTS AND METHODS

There were 40 patients (age: mean, 39 years; range, 22–25 years; 39 women and 1 man) comprising $n = 77$ soft-tissue lesions, who had treatment with the present technique from 1996 to 2013. Postoperative follow-up was from 6 months to 2 years. The treated anatomic areas were evaluated in 5 groups: (1) face (8 patients; 8 lesions); (2) gluteal (16 patients; 45 lesions); (3) breast (7 patients; 10 lesions); (4) abdomen (7 patients; 7 lesions); and (5) lower limb (2 patients; 6 lesions).

Surgical Technique

The surgical area was infiltrated with local anesthetic (lidocaine 0.5% with epinephrine 1:800,000). A 2-0 nylon monofilament suture with a curved needle (2–3 cm) was inserted 0.5–1 cm deep at the core of the depression at a single, crossed, or serial looping suture. The needle holder was used to pull the looping suture vertically upward, providing a virtual plane in the scar or depressed tissue. A 16- or 18-gauge needle (BD 30×12; Nokor needle; Becton Dickinson, Franklin Lakes, N.J.) that was attached to a syringe (10 mL) was inserted at the periphery of the retracted area. Circular motions of the needle were applied to release adhesions, and the bidigital patency sign confirmed the absence of residual retracted bands. In areas with retracted soft tissue >5-cm diameter, the needle was used with a miniblade (Doris model R-807; Richter Surgical, São Paulo, Brazil) (Figs. 1, 2).

RESULTS

In 27 (67%) of the total 40 patients, 1 treatment was done. In 10 cases (25%), 2 treatments were done.

In the group 1: face (8 cases, $n = 10$ sites), and group 4: abdomen (7 patients, $n = 7$ sites) were submitted to only one treatment. In the group 2: gluteal region (16 patients, $n = 45$ sites), 7 patients (43%) had 2 or 3 treatments. The same with 5 of 7 patients (70%) of group 3, breast. Depression <5-cm diameter was successfully released in all patients. Bruising around the treated areas persisted for 2–3 weeks. Moderate induration persisted until 3 months. In the gluteal region, 6 patients who had retracted area with diameter >5 cm developed seroma after treatment [buttock × lesions (13%)], which was resolved after needle aspiration in 2–3 ambulatory visits. Penrose drain for 2 weeks was indicated in 2 patients.

The results were also classified as poor, fair, and good according to clinical examinations, photographs, and patient testimony. In the 40 patients presenting soft-tissue depression, 26 were classified as having a good result (65%) and 12 as having a fair result (30%) (Table 1).

DISCUSSION

The present results confirmed the efficacy of the subcision combined with upward traction method at the diverse body sites, as previously reported for inverted nipple in the breast.

Scar depressions at the face, especially those that developed after external drainage of alveolar abscess along the mandibular border, were corrected satisfactorily.³ These retractions were typically at a diameter around 1 cm, and 1 surgical session usually corrected the soft-tissue irregularity. They may be difficult to treat because thin layer of the local tissue may be insufficient for regional flap transposition performed with open approaches. However, the present technique preserved the thin local soft tissue (Fig. 3) (See video, Supplemental Digital Content 1, which

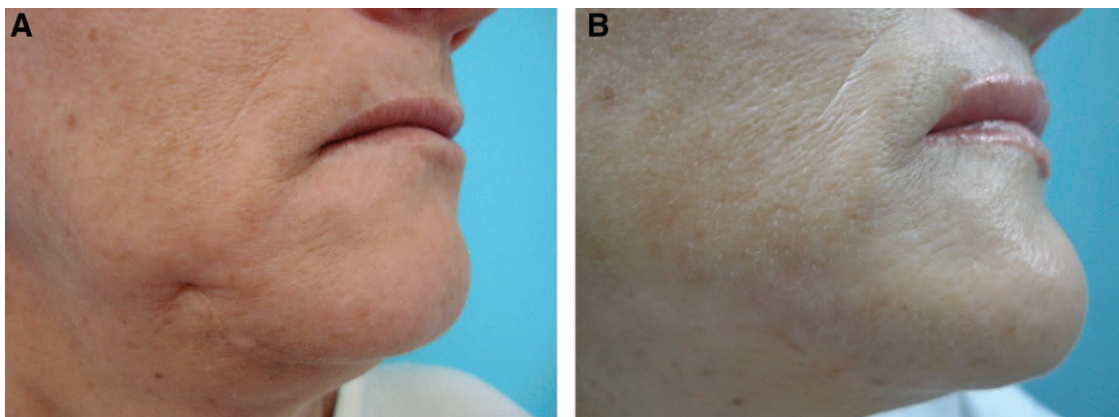
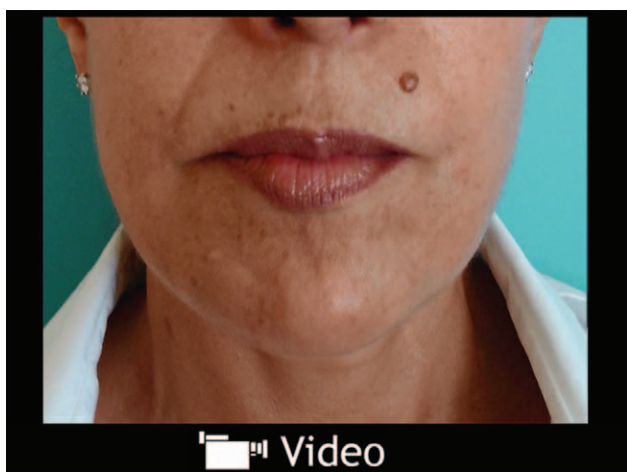


Fig. 3. A, A 36-year-old woman with an adherent facial scar at the mandibular border caused by sequelae of alveolar abscess drainage. B, Postoperative view shows satisfactory result after combined upward suture traction and subcision.

displays a 40-year-old female of the group 1 (facial region) during transoperative combined subcision with upward traction to treat mandibular soft-tissue retraction secondary alveolar abscess. This video is available in the Related Videos section of the Full-Text article on PRSGlobalOpen.com or available at <http://links.lww.com/PRSGO/A133>.

The technique may be indicated for subcutaneous lipotrophic (type 1A) and fibrotic gluteal retractions (type 1B). At rest, both types have tissue depression, which is aggravated with muscle contraction. These retractions are caused by adipose tissue atrophy after local fibrosis secondary abscess drainage, toxic effect of injections in the buttocks, or idiopathic causes. The



Video Graphic 1. See video, Supplemental Digital Content 1, which displays a 40-year-old woman of the group 1 (facial region) during transoperative combined subcision with upward traction to treat mandibular soft-tissue retraction secondary alveolar abscess. This video is available in the Related Videos section of the Full-Text article on PRSGlobalOpen.com or available at <http://links.lww.com/PRSGO/A133>.

present approach may be limited indication for fascial (type 2) and muscle retractions (type 3). In these cases, the gluteus retractions are normal at rest and do not change with muscle contraction. When the thigh is flexed, the fascia may cause a plaque-like depression, and muscle variation may cause linear depression parallel to the gluteus maximus fibers. In these patients, an open approach with fasciectomy and incision of the hardened fibers may be indicated.⁴

The fat grafts in the group 2 (gluteal) were indicated in cases after subcision with the purpose of smoothing the anatomic contouring of buttocks. Figure 4 shows the case of a 38-year-old woman presenting sequelae of multiple injections during her childhood. Diagnosed as type 1A retractions (lipotrophy), 1B (fibrosis), and a large depression >5 cm and mixed with points of cellulite grade 3. In the first session, it was indicated that combined subcision with traction should be performed. Four months later, the same procedure was done together with fine syringe lipoplasty with 1- and 2 mm cannula to level the surrounding tissue.

In patients who had gluteal retractions, satisfactory results were obtained when the tissue depression diameter was <5 cm. For those who have larger depressions, complications of treatment may include seroma, observed with 6 patients who had buttock depressions. However, vertical tissue suspension with suture optimized the procedure in patients who had prominent scar retraction caused by a previous inflammatory event, because tissue suspension created space that preserved a minimum subcutaneous layer and facilitated the excursion of the needle or miniblade.

Retracted tissue depressions in the abdomen typically were caused by scars after Cesarean section,

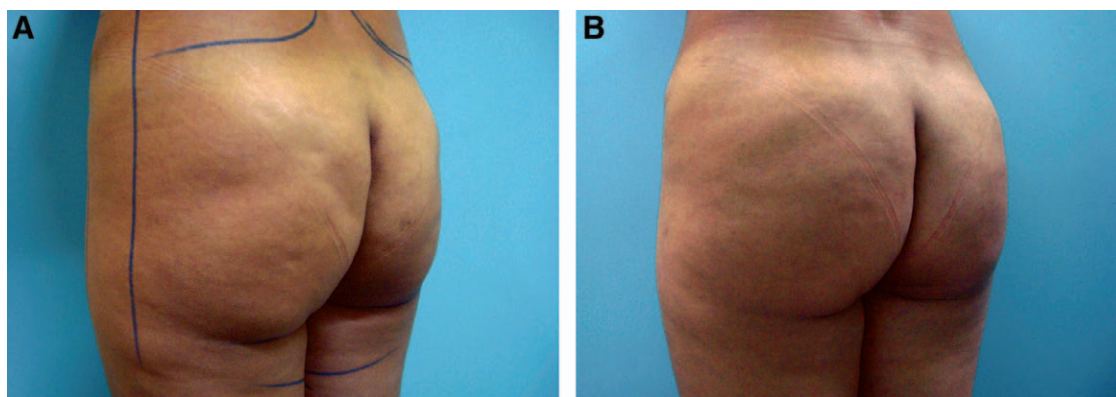


Fig. 4. A, Preoperative view of a 39-year-old woman who had multiple gluteal retractions from gynecoid lipodystrophy, grade 3 (cellulite) associated with retractions type 1A(lipotrophy) and 1B (fibrosis). B, Postoperative view after 1.5 years showing partial improvement after 3 sessions of combined upward traction and subcision. In the last session, it was associated with lipoplasty refinement using 10 cm³ syringe with 1 mm or 2 mm diameter cannula to equalize surface levels.



Fig. 5. A, A 41-year-old woman presenting axillary retraction after mastectomy with concomitant axillary lymphadenectomy, and radiotherapy. B, The retracted bands at the axilla were cut using a pink needle combined with upward traction of the depressed area after tumescent infiltration. C, Axillary configuration normalized after 2 sessions of combined upward traction.

laparotomy, or placement of drains, and the scar layer usually was very close to the muscular aponeurosis. The present subcision method was more effective than techniques that use cannulas during lipoplasty. In pure fibrotic zone, subcision associated with vertical tissue suspension facilitates the disruption of the adhesions.

Similar efficacy was noted in breast adhesions that were caused by mastectomy, axillary dissection, and radiotherapy. In these conditions, fat grafting may be unsuccessful because of fibrotic scar at the axilla. Releasing the adhesions with subcision and vertical traction may cause an inflammatory connective tissue response that may improve the nutritional supply of the region (Fig. 5). Concomitant use of a fat graft may increase the potential for integration of adipose and mesenchymal cells. In retracted axillary scars caused by nodal resection or radiotherapy, current methods may include fat graft infiltrated in tunnels or fillets or an external expansion system, but there is controversy, because of the integration of fat grafting and potential complications.⁵⁻¹⁰

Vertical traction with subcision method has the advantages compared with other traditional subcision techniques that use wire or suction.¹¹⁻¹⁴ These approaches affect the soft tissue in a static plane with the skin layers juxtaposed. The proposed strategy stretches the tissue layers and enables the release of the retracted bands in a deeper plane, which will be replaced with connective tissue (Fig. 6). As shown in guinea pigs, the scar tissue grafting causes tissue formation that fill the space created.¹⁵

The needle used was effective for smaller depressed tissue lesions, and the miniblade works better in lesions with diameter >5 cm. Although other instruments have been suggested, their effectiveness has been questioned.¹⁶

Complications of the present technique were noted primarily in the gluteal region, including fluid collection (seroma) at retracted areas of type 1A, 1B, and 1C lesions (diameter >5 cm). These complications usually resolved after ambulatory drain-

age except in 2 patients who required an indwelling Penrose drain for 2 weeks. In large soft-tissue retractions or linear type 3 or 4 lesions with retracted fascia or muscle adherence located on the buttocks, it may be advisable initially to release the central area, allow 2-3 months to healing, and later release the peripheral zone. This 2-stage approach may minimize dead space, the primary cause of seroma. Figure 7 shows the case of a 36-year-old patient

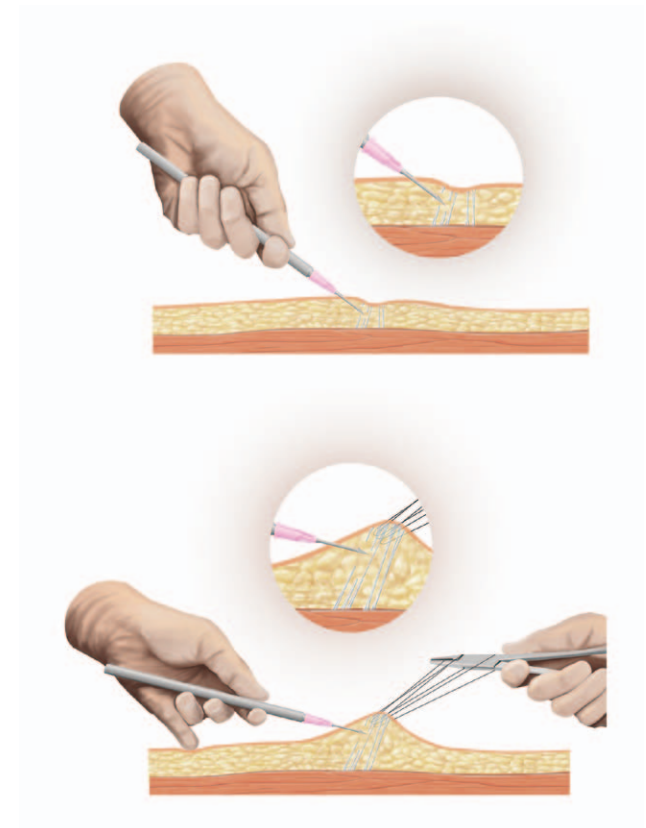


Fig. 6. A, Simple subcision compared with combined upward suture traction and percutaneous subcision. B, Traction with looping suture preserves the superficial layer and enables free excursion of the needle or miniblade at the deep part of the adhesion.

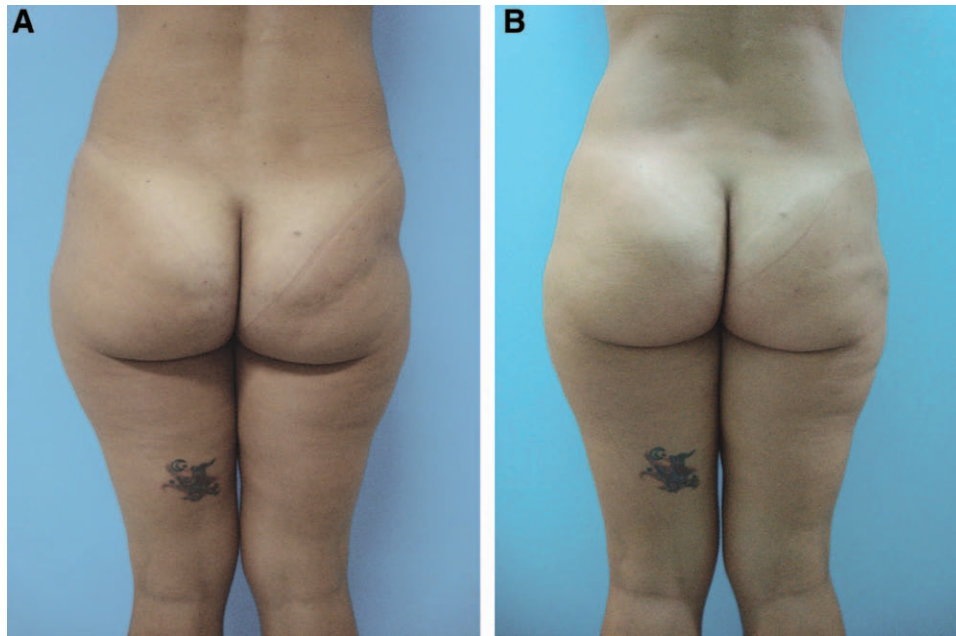


Fig. 7. A, A 36-year-old woman presents a transverse idiopathic type 2 (subfascial) > 5cm retraction at the right buttock and type 1A (lipoatrophy) at the left side. B, Result at 2 years after 3 sessions of ambulatory combined upward traction and subcision. The depressed area was >5 cm in diameter and initially was released in the central area. Subsequent sessions released the peripheral part of the depression.

presenting a transverse idiopathic type 2 (subfascial) >5-cm retraction. Three treatments were planned. In the first treatment, only the central part of the retraction was released. In a later date, 3–6 months apart, we released the periphery of the retraction and refined the contouring using 10-cm³ syringe with 1–2-mm cannula.

In patients who had treatment of gluteal lesions, induration in the treated area was the most frequent complaint at follow-up. In 2 patients, this induration persisted for 3 months. Patients may be advised that releasing the retracted bands may induce a healing response including initial bleeding, clot formation, and scar maturation.¹⁷ This healing response may

be controlled with triamcinolone (20 mg/mL) diluted 1:2 with lidocaine (2%) applied with a 30×7 brown needle at a depth of 15–20 mm, preserving the dermis; this injection may be used once or twice (minimum interval between 2 injections, 45 days) to prevent fat atrophy or telangiectasia. Late refinement with lipoplasty and superficial fat grafting with 1–2-mm cannula may help provide a smooth boundary at a chin and large gluteal depressions (type 1A, 1B, 1C) (Fig. 8).

In the gluteal region, the skin retractions were manifestations of gynecoid lipodystrophy, grade 3 (cellulite).^{18,19} In this condition, septa between the dermis and gluteus maximus fascia may cause



Fig. 8. A, Profile view of a 45-year-old woman who had severe retraction at the chin. This occurred after resection of a granuloma and was an iatrogenic complication of methacrylate cement. B, Second stage of combined upward suture traction and percutaneous subcision of adhesions. C, Postoperative view 20 months later after 3 sessions of combined subcision with upward traction refined with lipoplasty to smooth contour.



Video Graphic 2. See video Supplemental Digital Content 2, which displays a 39-year-old woman of the group 2 (gluteal region) presenting grade 3 cellulite, lipoatrophy (type 1A), and fibrosis (type 1B), 18 months after 2 sessions of combined subcision with upward traction. This video is available in the Related Videos section of the Full-Text article on PRSGlobalOpen.com or available at <http://links.lww.com/PRSGO/A134>.

multiple retractions. The vertical traction with the suture created a virtual space and enables the disruption of the septa while preserving a minimum layer of subdermal fat (thickness, 0.5–1 cm) that contributed to a smooth contour after treatment. The connective tissue healing created adequate tissue bulk at the previously retracted area. The most accepted current cellulite classification grade 0 is the absence of alterations of cutaneous surface; grade 1: the surface of the affected area is flat when the patient is lying on her back or standing up; grade 2: an “orange peel” or “padded” appearance is evident without any pinching or muscular contraction when the patient is standing up; grade 3: the alterations described in the grade 2 are present with elevations and nodulations. Considering the complex etiology of the gynecoid lipodystrophy, different grades may be present in the same patient. In our data, we indicated the procedure for cases with predominance of grade 3. In these cases, there is a correspondence of the theories that best explain the clinical expressions of the cellulite—the protusion of fat in the dermohypodermal junction due to the presence of vertical bands, according to Nürenberger and Müller.²⁰ Other authors postulated that the alteration is a genetically determined extension of those fascial bands.²¹ These alterations allow the protusion of fat into the dermohypodermic junction, causing the dimple skin. So, the tractioned subcision demonstrated in this investigation allows us to break these bands easily.

We did not register any seroma in the patients treated for cellulite in the group 2 (gluteal), probably because all the regions treated are <5-cm diameter and there is no association with previous scar.

The cellulite cases were classified mainly as a fair result. As a practical evaluation, we could consider reduction in 1 or 2 degrees, eg, grade 3 for grade 1. But, considering this entity as a multifactorial event that contributes to the gynecoid lipodystrophy, we suggest a generic classification. Video 2 (**See video, Supplemental Digital Content 2**, which displays a 39-year-old female of the group 2 (gluteal region) presenting grade 3 cellulite, lipoatrophy (type 1A), and fibrosis (1B), 18 months after 2 sessions of combined subcision with upward traction. This video is available in the Related Videos section of the Full-Text article on PRSGlobalOpen.com or available at <http://links.lww.com/PRSGO/A134>.) shows a 38-year-old woman presenting a predominant grade 3 cellulite at the buttocks, before and 18 months after 2 sessions of ambulatorial subcision with upward looping suture without fat graft. This case at rest and dynamic view was classified as fair result (**See video, Supplemental Digital Content 2**. This video is available in the Related Videos section of the Full-Text article on PRSGlobalOpen.com or available at <http://links.lww.com/PRSGO/A134>).

In summary, the present technique combining subcision after vertical suspension with looping suture may be effective in treating soft-tissue retractions. This approach may be indicated for varied lesions at diverse anatomic sites of soft-tissue depression, including gluteal retractions type 1A, 1B, and 1C. The simple method may provide satisfactory results with low risk of complications.

CONCLUSIONS

Percutaneous subcision combined with upward traction with stitches, as previously reported by the authors for treatment of inverted nipple type II and III, confirms its versatility to correct soft-tissue depression at diverse anatomic areas. Although retractions types 1A, 1B, and 1C of the group 2 bigger than 5 cm presented an incidence of seroma, it did not compromise the final outcome. The average result, classified as good in 65% and fair in 30%, makes the strategy an option in the treatment of soft-tissue depression.

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REFERENCES

1. Pereira Filho OJ, Bins-Ely J, Granemann AS, et al. Closed inverted nipple treatment through a microincision procedure. *Plast Reconstr Surg*. 2001;108:1000–1005.

2. Han S, Hong YG. The inverted nipple: its grading and surgical correction. *Plast Reconstr Surg*. 1999;104:389–395; discussion 396.
3. Ardehali MM, Jafari M, Hagh AB. Submandibular space abscess: a clinical trial for testing a new technique. *Otolaryngol Head Neck Surg*. 2012;146:716–718.
4. Gonzales R. Gluteal retractions: Classification and treatment techniques. *Aesthet Surg J*. 2006; 26: 537–550.
5. Pull, Coleman SR, Cui X, Ferguson RE Jr, Vasconez HC. Autologous fat grafts harvested and refined by the Coleman technique: a comparative study. *Plast Reconstr Surg*. 2008; 122:932–937.
6. Rigotti G, Marchi A, Micciolo PR, et al. On the safety of autologous fat grafting for breast reconstruction. *Plast Reconstr Surg*. 2012;130:206e–207e; author reply 208e.
7. Khouri RK, Eisenmann-Klein M, Cardoso E, et al. Brava and autologous fat transfer is a safe and effective breast augmentation alternative: results of a 6-year, 81-patient, prospective multicenter study. *Plast Reconstr Surg*. 2012;129:1173–1187.
8. Coleman SR. Structural fat grafts: the ideal filler? *Clin Plast Surg*. 2001;28:111–119.
9. Carpaneda CA, Ribeiro MT. Percentage of graft viability versus injected volume in adipose autotransplants. *Aesthetic Plast Surg*. 1994;18:17–19.
10. Mu DL, Luan J, Mu L, et al. Breast augmentation by autologous fat injection grafting: management and clinical analysis of complications. *Ann Plast Surg*. 2009;63:124–127.
11. Orentreich DS, Orentreich N. Subcutaneous incisionless (subcision) surgery for the correction of depressed scars and wrinkles. *Dermatol Surg*. 1995;21:543–549.
12. Echo A, Menn ZK, Friedman JD. A minimally invasive approach for the correction of a traumatic buttock deformity via wire subcision and volume replacement. *J Plast Reconstr Aesthet Surg*. 2012;65:e163–e165.
13. Aalami Harandi S, Balighi K, Lajevardi V, et al. Subcision-suction method: a new successful combination therapy in treatment of atrophic acne scars and other depressed scars. *J Eur Acad Dermatol Venereol*. 2011;25:92–99.
14. Graivier M. Wire subcision for complete release of depressions, subdermal attachments, and scars. *Aesthet Surg J*. 2006;26:387–394.
15. Sariguney Y, Demir YH, Yavuzer R, et al. Scar tissue graft as a filler for soft tissue augmentation. *Aesthetic Plast Surg*. 2007;31:692–696.
16. Lau YS, Offer GJ. Treatment of soft tissue contour defects by a combination of surgical subcision with a Beaver tympanoplasty blade and autologous fat grafting. *Aesthetic Plast Surg*. 2010;34:406–407.
17. Druecke D, Lamme EN, Hermann S, et al. Modulation of scar tissue formation using different dermal regeneration templates in the treatment of experimental full-thickness wounds. *Wound Repair Regen*. 2004;12:518–527.
18. de Godoy JM, Groggia MY, Ferro Laks L, et al. Intensive treatment of cellulite based on physiopathological principles. *Dermatol Res Pract*. 2012;2012:834280.
19. Rawlings AV. Cellulite and its treatment. *Int J Cosmet Sci*. 2006;28:175–190.
20. Nürnberger F, Müller G. So-called cellulite: an invented disease. *J Dermatol Surg Oncol*. 1978;4:221–229.
21. Piérard GE, Nizet JL, Piérard-Franchimont C. Cellulite: from standing fat herniation to hypodermal stretch marks. *Am J Dermatopathol*. 2000;22:34–37.