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Conventional versus ultrasound-assisted liposuction in gynaecomastia surgery: A 13-year review[☆]

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Summary *Background:* Numerous surgical techniques exist for gynaecomastia treatment. Although ultrasound-assisted liposuction (UAL) is thought to be more effective than conventional liposuction, to date there remains no objective and direct comparison of the two modalities. Hence, a comparative study was performed of a single surgeon's experience over 13 years using two definitive parameters, namely intraoperative conversion to open excision and postoperative revisional surgery rates.

Methods: All gynaecomastia patients treated with UAL or conventional liposuction (1999–2012) were retrospectively studied. UAL was only available in the private sector and was used for all such patients with no other selection or exclusion criteria.

Results: A total of 219 patients (384 breasts) with a mean age of 29 years (range 12–74) were evaluated. UAL was utilised in 24% of breasts (47 patients, 91 breasts). Compared with conventional liposuction, UAL had significantly lower rates of intraoperative conversion to open excision (25% vs. 39%; $p < 0.05$) and postoperative revision (2% vs. 19%; $p < 0.001$) using Fisher's exact test. The haematoma rate for each technique was 1%.

Conclusion: UAL is a more effective treatment modality for gynaecomastia than conventional liposuction as determined by intraoperative conversion to open surgery and subsequent need for revision.

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Introduction

A wide range of surgical techniques have been described for gynaecomastia treatment including various forms of liposuction, open excision, skin reduction and combinations. Over the past two decades, there has been growing interest in ultrasound-assisted liposuction (UAL) for this purpose.^{1–4} Although high complication rates were reported in some early studies,^{5–10} subsequent reports have suggested that postoperatively, UAL results in less ecchymosis and swelling, smoother breast contours and better post-operative skin contraction.^{1,4,11–13} However, all these supposed advantages are subjective, and specifically, there has been no objective and direct comparison to date of conventional or suction-assisted lipectomy (SAL) versus UAL in the treatment of gynaecomastia. It was therefore the objective of this investigation to review a single surgeon's experience over 13 years and retrospectively compare these two treatment modalities using two definitive end points, namely intraoperative conversion to open excision and postoperative revisional surgery rates.

Methods

Study design

This was a chart review of all gynaecomastia patients treated with UAL or conventional liposuction between September 1999 and January 2012 by a single operator (CMM). All the case records were available for review. UAL was only available in the private sector and was used for all such patients with no other selection or exclusion criteria. Following surgery, patients were reviewed in the outpatient clinic between October 1999 and September 2012. To avoid selection bias and minimise subjectivity, each episode of intraoperative conversion to open excision was included regardless of whether it had been planned preoperatively or not.

Operative techniques

All surgery was performed under general anaesthesia using standard techniques as previously published.^{4,13} Patients were marked preoperatively in the upright sitting position highlighting the inframammary fold, breast boundaries, planned stab incision sites and concentric topography-type marks centred on the most prominent portion of the breast. All patients underwent liposuction, whether conventional or ultrasonic, at the beginning of surgery¹³ and therefore the breast tissue was infiltrated through a stab incision in the lateral inframammary crease using a superwet/tumescent technique. The wetting solution consisted of Ringer's lactate containing 1 ml of 1 in 1000 solution of adrenaline (1 mg) and 30 ml of 1% lignocaine (300 mg) per litre. Drains were not routinely used.

Following the procedure, a pressure dressing consisting of fluffed-up gauze or Reston foam (3M Healthcare System, Borken, Germany) was applied and held in place with microfoam or mefix tape. Patients were instructed to wear a pressure garment day and night for 4–6 weeks. The following surgical techniques were used singly or in combination.

Conventional liposuction or SAL

After infiltration, a suction cannula was inserted through the same incision, and occasionally a second incision was made over the anterior axillary fold superiorly. A 4.6-mm or 5.2-mm Mercedes cannula was used for the initial suction by the palm down and pinch techniques. The final contouring was performed with a 3.7-mm Mercedes cannula. During suction, contour changes were constantly assessed by direct observation, while the thickness of the breast was evaluated intermittently with the contralateral hand. A close watch was also kept on the colour and volume of the aspirate. Once a satisfactory contour was obtained, the surrounding fat was feathered to avoid a noticeable saucer deformity, and any well-defined inframammary fold as determined preoperatively was disrupted.

Ultrasound-assisted liposuction

Ultrasonic liposuction was available only in the private sector and was performed with the Contour Genesis machine (Mentor Medical Systems, Santa Barbara, CA, USA) from 1999 to 2008. The amplitude was set at 85%, except in cases of exceptionally fibrous breasts, when it was increased to 95%. After infiltration with the wetting solution (400 ml/min rate), a hollow UAL cannula (golf-tee shape) was inserted through the same stab incisions as that used for conventional liposuction. Routine safety measures to avoid thermal injuries were taken^{3,4,13} including continuous saline irrigation through the sheath system (40 ml/h), use of a probe sheath, wet towels around the entry site and avoidance of 'end hits'. The cannula was continuously moved in fan-like long strokes, starting deep and working superficially. The strokes went beyond the marked boundaries of the breast enlargement, and as with SAL, a special effort was made to disrupt the inframammary fold where this was well formed. The well-described UAL end points were determined by loss of tissue resistance, aspirate volume, appearance of the aspirate and treatment time. Final evacuation and contouring was performed using conventional liposuction (3.7-mm Mercedes cannula) set at the machine's maximum of 10 ml/min.

From 2009 onwards, the Lysonix 3000 UAL was used (Mentor Medical Systems, Santa Barbara, CA, USA). This new equipment can be set on continuous or pulsed modes. It is less cumbersome and less labour intensive. Its efficient heat dissipation avoids the need for continuous cooling fluid

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