Case report

Successful management of persistent lower extremity lymphedema with suction-assisted lipectomy

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ABSTRACT

Introduction: Lower-extremity lymphedema is a significant complication attributed to gynecologic cancer surgery, potentially effectuating severe edema and discernible pain.

Case report: We report on a patient who developed persistent, lower-extremity lymphedema following her treatment for cervix cancer. Despite repeated efforts to manage the lymphedema with conventional measures, the patient's condition had not markedly improved. Thereafter, she underwent a suction-assisted lipectomy that effectively resolved her symptoms.

Conclusion: Since lymphedema often remains disabling and incurable following traditional therapy, suction-assisted lipectomy should be considered as an alternative when endeavoring to optimally manage this complication.

1. Introduction

The management for patients with locally, advanced cervical carcinoma frequently encompasses a hysterectomy with a bilateral salpingo-oophorectomy, and pelvic/para-aortic lymph node dissection; when indicated, adjuvant chemo-radiation is also considered therapeutically beneficial (Kim et al., 2017; Iwersen et al., 2017). Despite the relatively auspicious survival rates associated with this disease following treatment, a lymph node dissection and pelvic radiotherapy potentially coincide with an increased risk for morbidity, namely lymphedema (Mendivil et al., 2009; Boyages et al., 2015).

Lower extremity lymphedema is characterized by the swelling of ankles, legs and feet, with a documented incidence ranging from 1.2–37.8% in previously treated gynecologic cancer patients (Mendivil et al., 2009). The condition theoretically emanates from an obstruction or blockage of the lymphatic vessels into which the fluid is drained (Dixon, 2010), whereupon significant edema, discernible pain and emotional sequelae may be engendered (Mendivil et al., 2009; Ridner, 2009).

Conventional treatment for lymphedema predominantly incorporates manual lymph drainage, compression garments, self-bandaging and diuretics (Espinosa-de-Los-Monteros et al., 2009). When addressing more intractable or severe cases, excisional surgery has been employed to abstract edematous tissue (Garza 3rd et al., 2017).

Unfortunately, recurrence rates and complications (e.g., infection, thromboembolism and wound dehiscence) are disquieting, long-term outcomes (Boyages et al., 2015; Chiu, 2014).

Ultimately, since lymphedema often remains disabling and incurable, more novel approaches to optimally managing this condition should be evaluated (Boyages et al., 2015; Eryilmaz et al., 2009; Lamprou et al., 2017). In the current study, we recount a case involving a previously treated cervix cancer patient who developed persistent lymphedema that was successfully addressed with suction-assisted lipectomy.

2. Case

A 51-year-old, woman (gravid 1, para 1) was originally diagnosed in April 1999 with stage II-A squamous cell carcinoma of the cervix that infiltrated the lymph nodes. She underwent a radical hysterectomy, bilateral salpingo-oophorectomy and bilateral pelvic/para-aortic lymphadenectomy; all gross cancer was resected. Thereafter, the patient received six weeks of adjuvant pelvic radiotherapy (50.4 Gy) and five cycles of cisplatin (40 mg/m²) chemotherapy and has since remained in clinical remission.

The patient developed rectal bleeding in October 2002 and was referred for a gastroenterology consultation wherein a diagnosis of radiation colitis was rendered. During a follow-up visit in January 2004,
the patient exhibited left, lower extremity edema, which she initially observed during a recent airline flight; evaluation for a venous thrombosis was negative. A diagnosis of lymphedema was made and diuretics were initially prescribed, albeit with limited effect.

The patient was referred to an outpatient lymphedema clinic for evaluation in March 2005, whereupon she demonstrated increased (approximating 4.7 cm) left-sided girth in the infrapatellar region. Manual lymph drainage, therapeutic flexibility exercises and self-massage were prescribed, which marginally reduced the lymphedema by nearly 2.1 cm.

In October 2006, the patient developed cellulitis and was treated with cephalaxin (500 mg) and levofloxacin (500 mg) anti-biotic therapy, which effectively resolved her symptoms. In April 2007, she was evaluated by her gynecologic oncologist, who indicated that the lymphedema was stable and prescribed spironolactone (50 mg) and an elastic, specialty compression garment.

The patient was routinely assessed by her gynecologic oncologist but in June 2013, she remarked that her left lower extremity lymphedema was worsening insofar as walking and exercising were painful endeavors. Following an examination, she was referred to an outpatient lymphedema clinic, upon which 2+ pitting, chronic, left lower extremity lymphedema was discerned (50 cm at 60 cm from the 3rd nail base), compared to normal findings on the contralateral side (39.2 cm). The patient began therapy comprising self-bandaging, compression garments with thigh high pantyhose that applied 30–40 mmHg pressure, and manual lymph drainage.

In July 2014, the patient was assessed by her gynecologic oncologist, who reported that her circumferential measurements had increased (52.5 cm at 60 cm from the 3rd nail base); she then received a peripheral vascular disease consultation. A bilateral, lower extremity lymphedema clinic, upon which 2+ pitting, chronic, left lower extremity lymphedema was discerned (50 cm at 60 cm from the 3rd nail base), compared to normal findings on the contralateral side (39.2 cm). In November 2015, the patient exhibited left, lower extremity edema, which she initially noted at the ankle to the mid-thigh region. A sterile tourniquet was placed and in preparation for the procedure, the leg was exsanguinated to 250 mmHg, followed by an esmark bandage to exsanguinate the leg. Multiple skin stab incisions were made along the length of the leg using a #11 blade. Thereafter, a #4 Byron cannula was utilized to perform gentle, circumferential liposuction and to remove the excess fatty deposits from the ankle to the mid-thigh region.

Attention was made to contour the leg after liposuction with a #3 cannula to smooth out any visible irregularities. Consequently, a sterile, modified compression garment conforming to the healthy, right leg was applied to the left leg. The incisions remained open to facilitate drainage through the sleeve and the tourniquet was released.

The residual area in the upper thigh was injected with 1000 mL of tumescent solution, comprising 20 mL of 1% lidocaine, 1 amp of epinephrine and 8 mL of NaBicarb in 1 L of Lactated Ringer’s solution. After 10–15 min, suction assisted liposuction was performed circumferentially and afterwards, contouring of the upper thigh after liposuction was performed with a #3 Byron; upon completion, the compression sleeve was adjusted to condense the proximal part of the left thigh and thereafter, the entire leg was lightly wrapped with 6-inch Bias wraps. During the operative course, a total of 3300 mL of fat and liposaspirate was removed. The patient tolerated the procedure well and was transferred to the recovery room in stable condition.

The patient was evaluated by her plastic surgeon in December 2016, and there was an appreciable reduction in size and increased skin laxity inherent to the left limb (see Fig. 1b). In November 2017, the patient’s lymphedema was assessed during a follow-up consultation, and her improved status (e.g., reduced pain, enhanced ambulation) had remained constant (see Figs. Fig. 2a–b).

3. Discussion

Despite the numerous therapies available in the treatment of lower limb lymphedema, there is no standard approach that ultimately confers a beneficial outcome in all patients (Boyages et al., 2015). Initially, conservative measures for lymphedema were recommended, whereas surgical management was essentially considered palliative (i.e., attaining restorative function of the affected limb was the primary objective).

Liposuction, or suction-assisted lipectomy, was originally theorized as a treatment for lymphedema because of the potential to directly address the adipose hypertrophy inherent to this condition (Dixon, 2010; Brorson, 2011). Additionally, liposuction is ostensibly a viable option because the procedure extracts significant, hypertrophic fat deposits without incurring excessive incisions (Espinosa-de-Los-Monteros et al., 2009). Select reports have indicated that the procedure can be successfully employed in the management of lower extremity lymphedema (Espinosa-de-Los-Monteros et al., 2009; Eryilmaz et al., 2009) although there is some concern for the manifestation of cellulitis (Inghammar et al., 2014).

In the current study, we discuss a cervical carcinoma patient who...
presumably developed persistent, lower extremity lymphedema following surgery and adjuvant therapy. Despite numerous attempts at utilizing conventional therapy (e.g., manual lymph drainage, physical therapy), her condition remained intractable. Eventually, she underwent suction-assisted lpectomy to address her symptoms and has currently exhibited a beneficial, clinical outcome with 23 months of follow-up.

Epinosa de los Monteros et al. (Espinosa-de-Los-Monteros et al., 2009) described a lower leg lymphedema patient who was successfully treated with compression therapy and circumferential liposuction with 14 months of follow-up. Similarly, Eryilmaz et al. indicated that suction-assisted lpectomy was an effective, relatively non-invasive approach to managing their patient with bilateral, lower extremity lymphedema (Eryilmaz et al., 2009).

We recognize that our case study is limited, especially because the patient’s lymphedema was not consistently assessed with a standard approach; thus, we were unable to reliably corroborate the patient’s reported symptomatology with her clinical dimensions. Consequently, the study would have benefited from routine, circumferential evaluation, the most widely used method to calculate limb volume and peripheral measurement (Casley-Smith, 1994). Moreover, while we documented the long-term outcomes associated with the liposuction procedure, we are uncertain if the surgical approach was fundamentally curative.

Lymphedema is categorized as a non-life threatening issue, and therefore, the affliction may be neglected by the treating clinician. Nonetheless, since lymphedema can be inordinately painful and debilitating, patients should be referred to specialized rehabilitation clinics as they potentially advocate for and confer the most optimal treatments (Garfein et al., 2008). When addressing severe and intractable (i.e., unresponsive to conservative therapy) cases of lymphedema, suction-assisted lpectomy or liposuction may further reduce the patient’s symptoms or ideally, eventuate a definitive outcome. Hypothetically, liposuction is covered by insurance, especially in patients who are formally diagnosed and managed by a lymphedema specialist. Additional research investigating the efficacy of suction-assisted lpectomy in managing lower extremity lymphedema is warranted.

**Ethical consent**

Consent was obtained from the patient to publish this report.

**Conflict of interest statement**

The authors have no conflicts of interest to declare.

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