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Correspondence and Communications

Wound management in acute medicine

Dear Sir,

Wounds are common and often have a complex aetiology that may lead to serious consequences if mis-managed. Effective treatment relies on a good clinical assessment, understanding of the underlying aetiology and physiology and appropriate intervention.[1] Early appropriate wound management is likely to prevent further wound-related problems, shorten hospital stay and reduce re-admission rates.[2] This is particularly relevant in acute medicine where wounds are often referred late (especially when the wounds are not the primary medical presentation) and a lack of expertise in wound care exists.

The aim of this trial was to evaluate the ability of junior grade physicians to assess and manage wounds appropriately.

Two tests were devised consisting of 10 single-best answer questions. These questions assessed knowledge of various aspects of wounds, including type, physiology and grading (e.g. NICE Pressure Sore Classification[3] or NICE Burn Severity[4]) as well as different management options, such as dressings or/and surgery (Supplementary Data 1). Correct answers were based on the latest guidelines on wound assessment and management published by St George's University Hospital, London, UK (Supplementary Data 2). The first (pre-teaching) test was done during a lunchtime teaching session for trainee physicians in acute medical specialties and a teaching session was delivered immediately afterwards by the clinical lead nurse in plastic surgery (JH). This was followed by a second (post-teaching) test later that day to the same cohort of trainees. Fisher's exact test was used to identify differences between pre- and post-teaching outcomes and $P < 0.05$ was considered significant.

Eleven trainee physicians participated in the pre- and post-teaching tests, which included four foundation year doctors, three core trainees (CT1 and CT2), two specialist registrars (ST2 and ST4) and two doctors who did not specify their grade.

The majority of participants (89%) encountered wounds at least once a week and 56% dealt with them more frequently (Figure 1). Furthermore, 67% of participants considered that knowledge of wound assessment and management was 'very relevant' to trainee physicians, while the remaining 33% of participants felt it was 'fairly relevant'. No participants felt that this knowledge was 'fairly irrelevant' or 'very irrelevant'.

Prior to the teaching session, the highest performance was seen in questions assessing wound type with 78% correct responses (Figure 2). This was followed by wound grading (56%) and wound management (51.4%). The weakest performance was on wound physiology, with only 33.5% of answers being correct. However, after the teaching session, the highest performance was seen with questions on wound physiology (92.5% were correct) followed by wound type (89%) and wound grading (67%). Participants however continued to perform less well with questions about wound management (62.4% were correct).

These results showed an improved performance across all topics when compared to pre-teaching results (Figure 2). The greatest improvement was seen in wound physiology questions (33.5% to 92.5% correct; $P < 0.05$) and was significant, whilst questions on wound type, grading and management all improved but only by 11% and were not significant. All participants felt more confident assessing and managing wounds after the teaching session compared to 11% prior to the session.

These results demonstrate that trainee physicians may not have the knowledge to assess and manage wounds to standards set by our local NHS Healthcare Trust and low scores were seen especially with wound management questions. This is likely to lead to delay of appropriate treatment and in some cases, inappropriate management. Most participants highlighted that there was a lack of teaching on wound management in medical specialties.

Following the teaching session, participants gained a better understanding of wound physiology, which may correlate with improved scores on wound management, as participants may then have understood the rationale behind interventions for certain wound types.

This small study has limited power, but has identified that physicians may not meet the current standards for the assessment and management of wounds and targeted teaching can improve their knowledge. Whilst this has only been demonstrated in a single hospital study, regular teaching on wounds and their management by wound care specialists should be considered across hospitals in the UK.

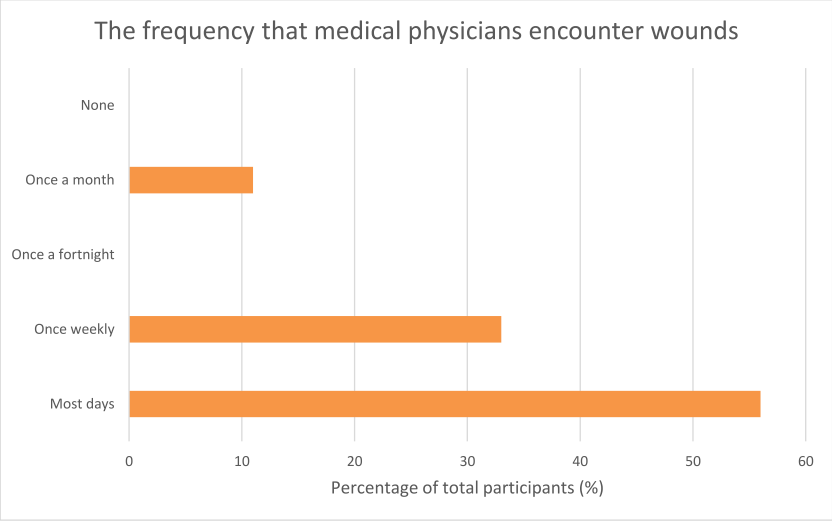

Figure 1 A bar chart demonstrating the frequency that medical physicians encounter wounds in acute medicine.

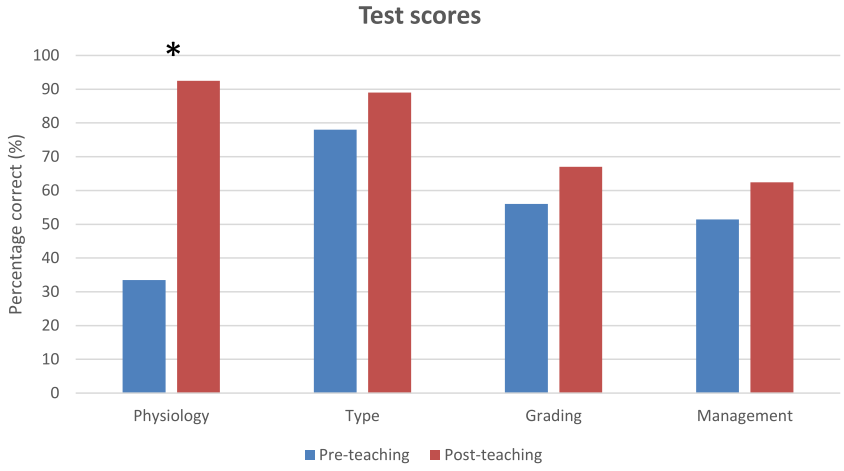

Figure 2 A bar chart demonstrating the change in test scores before and after the teaching session. * = $P < 0.05$.

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Conflict of interest

None.

Supplementary materials

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Adipose-derived stem cell research, worry and hope

Dear Sir,

In the wake of call for retractions of papers from Harvard University heart stem cell research lab, the public concerns had been raised about stem cell researches, including adipose-derived stem cells (ADSCs).

In 2001, Zuk et al.[1] isolated "mesenchymal stem cells (MSCs)" from adipose, termed adipose-derived stem cells (ADSCs). The applications for fat grafting since then have increased, within both regenerative and reconstructive surgery. During the past decades, we believe that fat tissue is an abundant favorable source of stem cells, and a worldwide range of scientific disciplines have adopted the use of ADSCs as an important tool for research and discovery.

A lot of studies indicate that ADSCs can differentiate into mesenchymal, cardiomyogenic,[2] neurogenic,[3] angiogenic[4] and hepatic lineages.[5] Over the past 3 years, more than 1000 research articles referring to ADSCs have been published every year. And several stem cells based clinical researches have been reported. The wildly varying papers have helped ADSCs become the pluripotent, near magical cells for many therapeutic interventions in multiple unrelated diseases, meaning that they can differentiate into almost every cell type in the adult body. However, most of these works are based on under-powered study.

We identify adipocytes as the cells that primarily compose adipose tissue, but storing energy as fat is not their only function. In fact, adipocytes have many functions in various tissues beyond energy storage, including regulating metabolism, growth, wound healing and immunity. Many researches only proved one or two of these natural functions of adipocytes, but jumped to the conclusions claimed "stem cell".

In fact, tissue-specific stem cells, which have a limited ability to turn into other cell types, are the norm in most of the adult body. In multicellular animals, most of the cells contain the complete genome of organisms, which contains much more information than any cell itself needs to survive. After the completion of tissue development, many cells still have the ability of growth and differentiation. Fat must contain stem cell populations that help to maintain its tissues. In our view, ADSCs based-regeneration could be a great breaking through in plastic surgery.

It must be emphasized that we still know little about adipose-derived stem cells. What is needed is a coordinated global effort to improve understanding of the biology of the ADSCs, this may require a focused undertaking by stem-cell biologists, bioinformatists and plastic surgeons. The reliable identification of ADSCs should involve omics approaches, such as those designed to analyze the gene expression patterns of a cell or its protein content, and rigorous assays to establish what a particular cell can differentiate into, in vivo and in vitro. The scientific principles that guide future research and clinical use should be: precision, validation, characterization, and objectivity.

To quote Linus Pauling, winners of the Nobel Prize in both Chemistry and Peace, "The best way to have a good idea is to have a lot of ideas". Much remains to be done.

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Healing and maturation of the free Gracilis flap in extremity reconstruction: A patient perspective

Dear Sir,

Advancements in lower extremity reconstruction have made free tissue transfer for open lower limb fractures the gold standard of care in many units.[1,2] Decisions regarding the use of fasciocutaneous versus muscle flaps are both surgeon and patient dependent. Muscle flaps are specifically unsightly to patients in the early stages of their reconstruc-

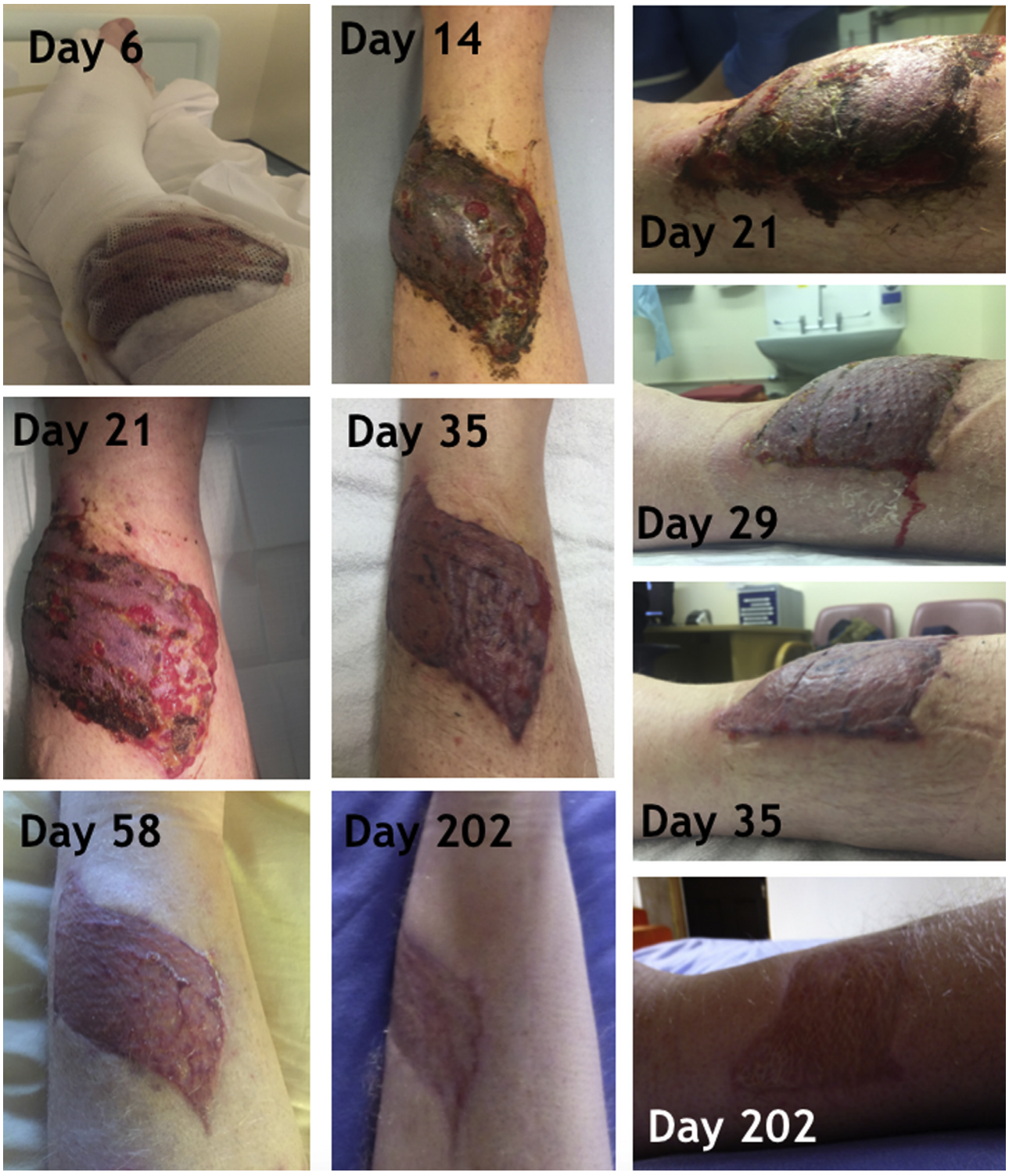

Figure 1 Photographic documentation (Day 6 to Day 202).

tion. However, the free Gracilis flap is quick to raise, with predictable anatomy, minimal donor site morbidity and is the workhorse flap for lower extremity reconstruction in our unit.

Our patient photographed and documented their own experience including flap healing over a 396 day period.

The patient is a 44 year old gentleman who presented to the Joint Orthopaedics and Plastics MDT Clinic, Leeds General Infirmary with osteomyelitis of the right tibia following a road traffic collision in 1998. The patient underwent bone debridement, insertion of antibiotic impregnated cement (Stimulan®) and microvascular free tissue transfer

(free Gracilis flap). The secondary Orthopaedic surgery including application of a Taylor Spatial Frame (Day 204) and removal in clinic (Day 396).

Patient documentation of own journey

Day 1 First Operation	Debridement of bone and free flap
	High Dependency Unit 48 h
	Warmer, Catheter and regular observations
Day 4	Leg dangled out of the side of the bed
Day 6	Mobilised with physiotherapy
Day 10	Discharged from hospital
Day 14	Return to clinic
	Partial Weight bearing in support boot
	Tubigrip applied
	Pain levels low in debrided leg, high in donor leg
Day 202	Continued with compression in tubigrip
Day 204 Second Operation	Application of TSF
Day 396	Frame removal in clinic

The photographs demonstrate the likely healing outcomes and changes in both skin colour and quality, and contour deformity. These images can reassure both surgeon and patient that the initial bulky muscle does shrink and flatten with time. Although clearly there is a scar with skin colour difference, compared to a fasciocutaneous flap, the colour softens and matures like a standard skin graft. In this case no contour deformity is seen at day 202. No secondary debulking surgery was required on the flap which can often be the case with a standard fasciocutaneous flap (Figure 1).

In our unit the photographs have been printed as poster in clinic and are used as part of the informed consent process when undertaking free muscle flaps. The authors feel that this is an excellent example for surgeons to use with their patients in demonstrating healing and maturation of the free Gracilis Flap.

Consent

Special thanks are given to patient RD, who photographed his recovery and consented to use in clinic and publication.

Conflict of interest

None.

Funding

None.

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Double barrel lymphaticovenular anastomosis

Dear Sir,

With improvements in the super-micro surgical technique, lymphaticovenular anastomosis (LVA) has become an effective treatment for obstructive lymph edema[1]. Recently, indocyanine green (ICG) dye lymphography makes it possible to visualize lymph vessels. LVA requires specific veins in the field. However veins come in a variety of sizes, and options for anastomosis i.e., end to end, end to side and side to end are chosen to deal with the discrepancies between lymph vessels and veins[2]. On the other hand, lymph vessels are sometimes bunched. An example is the double barrel vessel formation. These two lymph vessels are difficult to separate without injuring the vessels and the vasa vasorum. The double barrel anastomosis technique has been reported in cardiovascular surgery for the treatment of systemic ventricular outflow obstruction[3]. However this technique has not been reported in microsurgical anastomosis yet. In this report, we would like to introduce a double barrel microsurgical anastomosis technique using a video.

A 62-year-old female developed lower limb lymph edema 5 years post hysterectomy and pelvic lymph node dissection. Her lymph edema was International Society of Lymphedema Stage II. Under general anesthesia, 4 LVAs were performed with 4 incisions. The surgical sites were determined on the lymph vessels and subdermal veins which were examined using ICG lymphography and ultrasonography. Below the knee, lymph vessels formed a double barrel and a thick vein appeared in the field. After cutting off the lymph vessels, it was confirmed that lymph was gushing out from the vessels. Short 5-0 nylon threads were inserted into each lymph vessel. Then, the threads were inserted into the vein to stabilize the vessels. First, LVA was initiated from the lateral side of the two lymph vessels using 11-0

nylon thread. Secondly, the midpoint of the two lymph vessels and the vein were sutured. After that the two sutures were placed between the previous sutures. Posterior sutures were performed following the same steps. The final suture was tied after the inserted nylon thread was removed. The patency was evaluated using ICG lymphography (see video).

Finding appropriate veins for a successful LVA is challenging. In addition, surgeons have to be skilled at different anastomosis techniques to better respond to specific situation. The double barrel technique can resolve double lymphatic flow without separating the two lymph vessels. This technique can become a viable option for LVA.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.bjps.2018.11.018.

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Application of suction retractor for lymphaticovenular anastomoisis☆

Dear Sir,

As super-micro surgical techniques have improved, lymphaticovenular anastomosis (LVA) has become the major treatment for lymph edema. Furthermore, indocyanine green fluorescent lymphography (ILG) can detect lymph vessels accurately[1] and LVA can be performed through a small incision. However, lymph vessels which are suitable for LVA exist under the superficial fascia[2] therefore an assistant has to open the surgical site or retractors are required. Another factor that makes LVA complicated is lymph fluid. Sometimes surgeons are required to perform LVA while the surgical site is submerged in lymph fluid. Handling the thin 11-0 or 12-0 nylon threads under condition is challenging. To deal with these conditions and make it possible to perform LVA only a single surgeon, we used a lid retractor with suction function.

Lymph vessels were marked using ILG, then subdermal veins were examined using ultrasonography. Small incisions approximately 10 mm wide were made at the site where lymph vessels and veins existed closely. After the superficial fascia was incised, a lid retractor was used to open the site. When the surgical site became wet with extravasated lymph fluid, the lid retractor with suction function (Product No. 37-0015, Charmant Inc. Fukui Japan) was used (Figure 1). Small drainage holes on its bilateral arms can suction fluid and keep the surgical site clear (see video).

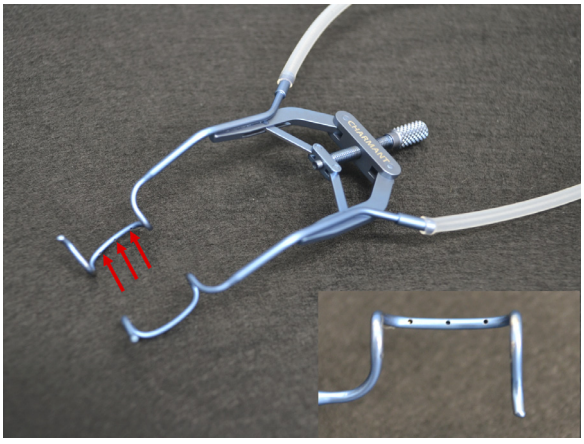

Figure 1 Image of lid retractor with suction function. Small drainage holes on its bilateral arms can suction fluid.

☆ Parts of this article have been presented at the 22nd Annual Meeting of the Japan Society for Innovative Techniques in Plastic Surgery, 2017.

Compared to vascular anastomosis, LVA is still technically challenging. Although several surgical techniques to support LVA[3,4] have been reported, new devices which can keep the surgical site clear could help reduce stress on surgeons and improve the outcome of treatment.

Conflict of interest

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Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.bjps.2018.12.019.

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Anatomic location of a sensory nerve to the lateral thigh flap: A novel option for sensate autologous tissue reconstruction

Dear Sir,

The principle of providing sensate reconstruction is not novel and has enhanced reconstruction of many regions of the body from a protective and functional standpoint.

The lateral thigh provides various options for autologous reconstruction, including the anterolateral thigh (ALT) flap, tensor fascia lata (TFL) flap, profunda artery perforator (PAP) flap and the lateral thigh perforator (LTP) flap. The lateral femoral cutaneous nerve (LFCN) supplies sensation to these regions. However, the anatomy of the LFCN is quite variable.[1] While the distribution of a branch of the LFCN to the ALT flap has been well described,[2] its caudal anatomical location precludes including this branch in a LTP flap. Articles describing the surgical approach to the LTP flap describe the sensory nerve branch as entering the anterior aspect of the flap without any further anatomical delineation.[3,4] Thus, the goal of this study was to determine the ease of identifying the LFCN in the context of the lateral thigh perforator flap dissection.

Methods

Five bilateral cadaveric dissections were conducted to locate the sensory branch to the LTP flap. Measurements were made in each cadaver for the entry of the nerve to the flap from the anterior superior iliac spine (ASIS), lateral edge of pubic bone and perforator. Based on our experience, we then determined an effective and reliable way to access to sensory branch during flap elevation.

Results

The sensory nerve was located in all cadavers. In all but one cadaver, the nerve(s) entered the flap cephalic to the perforator. One cadaver had two sensory branches identified, three had one sensory branch identified and one had one sensory branch on one side and two on the contralateral side. For the cadaver that had one and two sensory branches, the side with two branches converged prior to flap entrance. For the cadaver that had two branches per side, the nerves entered the flap at divergent sites and all measurements were included for averages. The sensory nerve was on average 9.1 cm (SD 3.8 cm, range 5–19 cm) from the ASIS and 14.1 cm (SD 2.1 cm, range 11–18.5 cm) from the pubic tubercle. Figures 1 and 2.

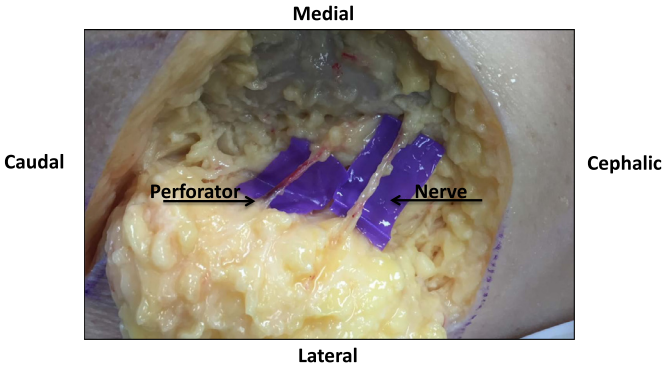

Figure 1 Location of sensory branch to lateral thigh flap with close-up of nerve entering flap in proximity to perforator.

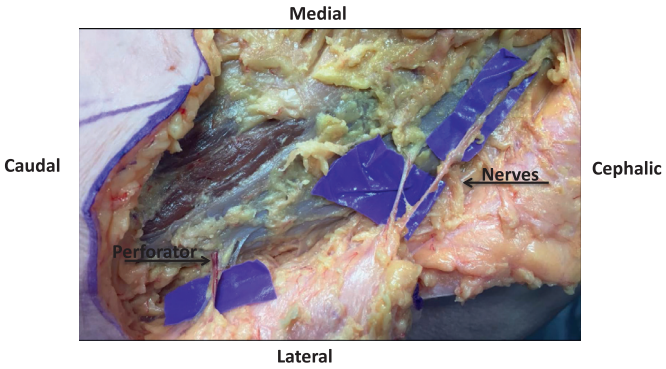

Figure 2 Branching pattern of cadaver with two sensory nerves supplying flap.

Discussion

The field of innervated autologous reconstruction is rapidly expanding. The ability to provide sensation reconstruction is crucial for both protective and functional reconstruction. A study from our group (in press) discussed options for autologous breast reconstruction where the option for sensate reconstruction had/had not been described. We found that for numerous autologous options, the anatomy of the sensory nerves within the flap had not been described.

The lateral thigh provides various options for autologous reconstruction, including the ALT, TFL, PAP and LTP flaps. The LFCN supplies sensation to all these flaps. However, the anatomy of the LFCN is quite variable. A meta-analysis reviewed 24 studies and 1720 lower extremities to determine the branching patterns and location of the LFCN. It was found that the most common branching pattern of the LFCN involved the nerve exiting the pelvis medial to the sartorius muscle as a single branch 1.9 cm medial to the ASIS. However, there were many variations described in regards to branching pattern, relationship to the inguinal ligament and perforation of the TFL.[1]

The ALT flap, commonly provided as a sensate flap, is supplied by the LFCN and has been utilized for sensate reconstruction. A cadaveric study found that the LFCN was easily and reproducibly identified during flap dissection. Articles describe the nerve to the LFP flap as entering the anterior aspect without any further anatomical description.[3,4]

Thus, the goal of this study was to determine the ease of identifying the LFCN in the context of the LTP flap dissection. We found that the sensory nerve had a variable branching pattern and location within in the flap. While the nerve typically entered the flap cephalic to the perforator, in one cadaver, it entered caudal to the perforator. Even though other studies describe the nerve as entering the anterior aspect of the flap,[3,4] we found the nerve easiest to identify from the superior aspect. To allow for nerve identification, we first made the superior incision and then used blunt dissection through subcutaneous tissue and easily identified the nerve entering from a cephalic direction. We were then able to dissect the nerve proximally to gain desired length for potential transfer and coaptation.

Microsurgical reconstruction requires difficult, tedious dissection and long operating hours. Thus, unless a surgeon is familiar with the location of a possible sensory nerve, the nerve is likely to be transected or sensate reconstruction will not be attempted. This is the first study to report on the consistent location of a sensory nerve to the LTP flap. We hope this report will enable surgeons to expand their options of donor tissue for patients who desire sensate autologous reconstruction.

Conflict of interest

None of the authors have any funding or conflicts of interests to report.

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Keystone island flaps for reconstruction following lower leg skin cancer resection: A comparison with split-thickness skin grafts

Dear Sir,

The lower leg is a common site for skin cancer in older patients. For all but the smallest defects, split thickness skin grafts (SSG) remain the mainstay of reconstruction in this patient group but are complicated by poor graft take, donor site morbidity and poor aesthetics.[1] Local flaps are an attractive option, given their like-for-like characteristics but limited soft tissue availability makes traditional local flaps challenging.

First popularized by Behan, the keystone island flap (KIF) is a perforator-based trapezoidal flap that achieves soft tissue coverage, preserves vascular and neural integrity and minimises the need for skin grafting.[2] Several studies have suggested that KIFs have more therapeutic applications in lower limb defects compared to SSGs, yet no direct comparison has been made between the two forms of reconstruction.[3] This paper is the first to compare the surgical outcomes between KIFs and SSGs in lower limb defects following oncological excision.

Table 1 The surgical outcomes and common complications of each patient group.

	Keystone island flap	Split thickness skin graft
Success rate	13/13	11/13
Mean healing time in days (range)	25 (9-54)	22 (8-60)
Complication rate	7/13	9/13
Infection	4	3
Wound dehiscence	4	0
Pain	1	4
Delayed healing	1	4
***Re*-admission**	1	3
***Re*-operation**	0	2

Between 2011–2013, a retrospective study was undertaken of consecutive patients who had excision of a cutaneous neoplasm on the lower leg followed by either KIF or SSG reconstruction, at a single plastic surgery unit. All KIF reconstructions were performed by the senior author, in accordance with the original description.[2] SSGs were undertaken by three different consultant plastic surgeons. A standardised proforma was used to collect patient information, success rates, post-operative complications and follow-up care. Patients were asked for their opinion of the aesthetic outcomes following their reconstruction. The two groups were compared using Fisher's exact test with $p < 0.05$ considered statistically significant.

Thirteen KIF reconstructions (2 male, 11 female) and SSGs reconstructions (4 male, 9 female) were performed as daycase procedures. The mean age of patients across both groups was 72 (range 38–92).

The most common histology was squamous cell carcinomas ($N = 6$) in the KIF group and basal cell carcinomas ($N = 5$) in the SSG group.

All KIF reconstructions healed without the need for further surgical intervention. In the SSG group, 2/13 required further grafting for graft failure (Table 1). The mean healing time was slightly longer in the KIF group (25 days) compared to the SSG group (22 days) but this difference was not statistically significant. All tumours were completely excised and there was no local recurrence over the two-year study period.

The complication rate in the KIF group was 7/13, compared with 9/13 in the SSG group (Table 1). The most common complication in the KIF group was wound infection ($n = 4$) and wound dehiscence ($n = 4$). This led to one KIF patient requiring admission for intravenous antibiotics and observation. Pain ($n = 4$), delayed healing ($n = 4$) and partial graft failure ($n = 4$) were the most common complications in the SSG group. Three patients required re-admission in the SSG group and two patients required a re-operation for further skin grafting.

On subjective evaluation, the majority of patients from the KIF group were satisfied with the aesthetics of the re-

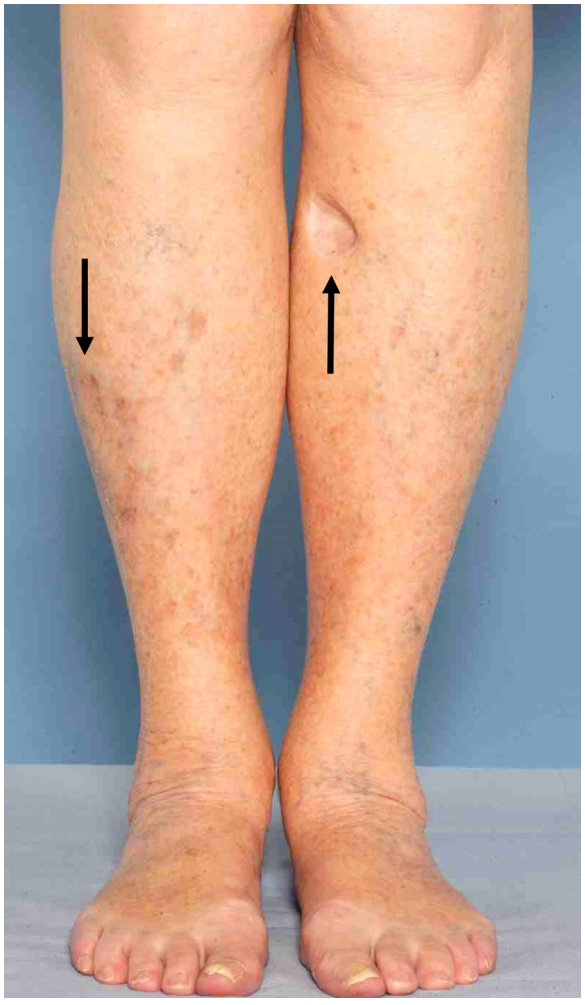

Figure 1 Anterior view of a recent KIF reconstruction of the right leg at 4 weeks following surgery and previous SSG reconstruction of the left leg from patient 5.

construction. This is illustrated by patient 5 (Figure 1) who found the result of the KIF reconstruction more aesthetically pleasing compared to their previous SSG. Patients from the SSG group had concerns based around the size of the defect, the contour defect and the rough surface texture of the graft.

Based on our retrospective analysis, the KIF yielded a higher success rate with fewer complications compared to the SSGs. When complications did occur, wound dehiscence and infection were most common in the KIF group, likely due to the intrinsic tension through the central region of the flap.[4] As such, the size of the flap, extent of release and Y-V movement of the flap apices will influence this tension to some extent. In contrast, SSGs produce lower wound tension, particularly when meshed, at the expense of aesthetics and a donor site wound.

Delayed healing occurred less frequently in KIFs than SSGs. This could be explained by the observations of Behan who described a "hyperaemic flare" (pink-coloured flap) and "red dot sign" (bleeding on suture needle insertion), attributing this to the increased arteriole and venule diameters within the flap, thereby increasing perfusion.[5] KIFs may therefore yield higher survival rates and reduced need for salvage compared to SSGs which rely on a well-established and constant vascular bed.

Subjective feedback suggests that KIFs are superior to SSGs in terms of cosmesis. KIFs use adjacent soft tissue to reconstruct the defect, replacing like-with-like, producing a better soft tissue match, less contour defect and less scarring compared to SSGs (Supplementary Data 1).

This small-scale study demonstrates the utility of the KIF in reconstruction after excision of skin cancers in the lower leg. Compared with SSGs, KIFs healed with fewer complications and better aesthetics than SSGs for lower leg reconstruction after skin cancer excision. Certain parameters such as flap size, location and tissue laxity should be considered to minimise risks associated with wound dehiscence and subsequent infection when performing this reconstruction.

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Conflict of interest statement

None.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.bjps.2018.12.016.

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Aerosol-related thermal injuries: A simple approach to managing a frosty problem

Dear Sir,

Invented over 80 years ago, aerosol cans are now part of our everyday life. Body deodorants and air fresheners are readily available in any supermarket. Aerosol-related frostbites are being seen more often over last two decades and many cases are seen following deliberate self-harm from readily-available deodorant cans. 'Frosting is a practice increasingly seen in pediatric and adolescent patients.[1] Although occasional aerosol-related frostbites have been reported widely, no treatment guidelines have been proposed to date.[1–3]

Upon release, the aerosol gas payload which is propelled from a pressurised container vaporises and expands. Both of these manifest changes cause a drop in the temperature which has been shown to be as low as −40 °C.[2,3] Exposure over a prolonged period can result in significant frostbite over exposed area. Damage to the dermis occurs as a result of direct cellular damage caused by formation of ice crystals and injury-related ischaemia.[4] Resulting frostbite may take many weeks to settle and declare the full extent of the damage caused.

Most patients with aerosol frostbite burns who have been treated at our unit in recent years sustained their injuries as a result of deliberate self-harm and had significantly delayed presentations to the burns unit following the insult despite prior medical wound review. We feel that initial management of such injuries is unclear to emergency departments and community healthcare professionals. Furthermore, our experience to date suggests that aerosol frostbite is increasing in frequency as a method used to inflict deliberate self-harm injuries.[5]

We therefore propose that such burns should be managed in the same way as freeze cold injuries.[4] This includes taking a detailed history and making a thorough assessment of the patient (including a psychiatric assessment if needed). Once frostbite has been diagnosed, rapid warming of the affected area by means of warm wet towels or baths of warmed (but not hot) water should be initiated. The local burns unit should be contacted immediately for further advice and review if necessary. Additionally, patients should be warned that it may take quite some time for final demarcation to occur. Acutely, elevation (where appropriate) and analgesia should be advised, and wounds should be dressed with non-adherent dressings. These patients should be monitored on regular basis in case the resulting injury requires surgical intervention and in the long-term be counselled about the risk of altered pigmentation to the damaged area and the requirement for ultraviolet protection with sunscreen. Smoking cessation advice should be given to optimise peripheral blood flow and healing.

We feel strongly that increased awareness and knowledge of how to treat aerosol-related cold burn injuries in emergency departments and in the community will increase quality of care provided and minimise the harm caused by these household items. Furthermore, this is especially important for those who repeatedly self-harm, as those who support them can be informed about and empowered to use the best first aid for these injuries.

Conflict of interest statement

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Letter re "Anaesthesia for collagenase clostridium histolyticom injection in patients with Dupuytren's disease: A cohort analysis"☆

Dear Sir,

Sanjuan-Cervero et al.[1] report that patients undergoing collagenase injections for the treatment of Dupuytren's contracture report less pain if a wrist block is performed first. Unfortunately the authors did not account for the pain of 10mls of mepivacaine being injected through two injections at the wrist.

It is stated that local anaesthetic is not routinely used as it might confound evaluation of treatment, or that if administered close to the treatment site, might dilute the collagenase.

More important than these, however, is the rare but serious risk of intraneural collagenase injection. This risk is recognised by the manufacturers, who state in the injection training brochure that local anaesthetic is not recommended (https://www.medicines.org.uk/emc/rmm/78/Document). The severe pain that would be experienced by intraneural needle penetration would alert the clinician to stop immediately and withdraw.

I do not offer local anaesthetic before injection of collagenase, and in my experience, the pain experienced by patients is reported as less than that caused by wrist block.

Conflict of interest

None.

Funding

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☆ This work has not been presented at any meetings.

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Response to the comment of Mr. J. Henderson on paper "Anaesthesia in the colagenase clostridium histolyticum injection for Dupuytren's disease: A cohort analysis"☆

Dear Sir,

We thank Mr. Henderson for his comment and interest in our work. Indeed, we compared the results of using or not using local anesthesia (LA) before injection and found that those not using LA had very intense pain scores (NRS with a value of 10).[6,8] In this paper, we found a relationship between pain scores during injection and extension and as a consequence less pain implies less traumatic experience. As we already know, pain is a reason for greater dissatisfaction in patients undergoing treatment with CCH as it has already been shown by Bradley in his survey.[1]

It is true, that pain associated with a wrist block was not evaluated in our study. We mentioned this as a limitation in our study,[7] but the purpose of our study was to evaluate pain experienced during injection and extension and find out whether getting lower pain values in the first could also be achieved in the latter. The data Mr. Henderson require is provided in the paper by Nordenskjöld[3] with a VAS value of 2.9 (nonpathological parameter < 3). In this work, as in our study, are shown pathological VAS values higher than 4.5 without the use of a wrist block. For this reason, we advocate the use of anesthesia during the injection process.

For the reasons you have mentioned, the FDA provides a recommendation against the use of local anesthetics in the site of CCH injection. In our study, LA is used proximal to the injection site so to avoid mixing CCH with LA. About the possibility of injection CCH inside a nerve, there are no cases describing this problem in the reviews of secondary effects of the drug,[4,6,8] And there seems to be no negative effects on the nerve with the effect the drug has on the myelin sheath.[5] So, probably the cases of severe pain after injection are more related to fibrosis occurring around the injection site.

You are right about what is said in the training for CCH administration but our views are also shared by other authors[2,3,6,8] and, in our opinion, the pain encountered in patients required some actions.

☆This work has not been presented at any meetings.

Finally, according to our experience, having no pain with the injection makes the patient more compliant during the extension procedure. We usually make a soft massage in the area previous to the extension of the finger and tell the patients to start moving the affected finger without any kind of help. Patients with lower levels of pain are more involved during the extension process and oftentimes achieving extension on their own without the physicians' assistance.

Conflict of interest

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Temporal trends in immediate post-mastectomy breast reconstruction

Dear Sir,

Breast reconstruction after mastectomy offers significant improvements in quality of life for breast cancer (BC) patients. To improve access to post-mastectomy breast reconstruction (PMBR) for BC patients in the U.S., the Women's Health and Cancer Rights Act (WHCRA) was implemented in 1999, mandating coverage of PMBR by all insurers. Prior to WHCRA, post mastectomy breast reconstruction (PMBR) was variably covered by insurers as it was primarily viewed as a cosmetic procedure. The objectives of this study were to explore whether the incidence of PMBR has changed over time and whether patient age, receipt of radiation therapy, or tumor grade has an effect on the incidence of reconstruction over time. Adult women ($\geq$18 years) with a new diagnosis of BC between 2000 and 2014, that underwent mastectomy (subcutaneous [30], simple [40–49, 75], modified radical [50–59, 63], radical [60–62, 64–69, 73–74], and unspecified [80]) were identified using Surveillance, Epidemiology, and End Results (SEER) registry. The SEER program prospectively collects de-identified information on individuals diagnosed with cancer from 18 registries across the United States, and covers roughly 30% of the population. The yearly incidence of PMBR within the first four months after mastectomy (43–49, 53–59, 63–70, and 73–75) was estimated using Poisson regression. Weighted log-binomial regression was used to assess the marginal (i.e. overall) association between year of diagnosis and PMBR. Inverse probability of treatment weights (IPTW) were estimated using generalized multivariable logistic regression, adjusting for patient's age (modeled as a restricted cubic spline), race/ethnicity, marital status, region, invasive disease status, whether it was the patient's first cancer diagnosis, tumor grade, ER status, PR status, adjusted AJCC 6th T and N, and radiation status (yes/no). Weights were then standardized by the marginal probability of being diagnosed each year. In order to account for missingness of marital status ($n = 13{,}311$, 4%), ER status ($n = 34{,}607$, 11%), and PR status ($n = 30{,}270$, 9%), inverse-probability of missingness weights (IPMW) were used. The probability of being a complete case (i.e. no missing data) was estimated using multivariable logistic regression, adjusting for age, race/ethnicity, region, invasive disease status, whether it was the patient's first cancer diagnosis, tumor grade, adjusted AJCC 6th T, adjusted AJCC 6th N, and radiation status. IPMW for each patient was stabilized using the overall probability of being a complete case. The IPTW and IPMW were multiplied together to create the final, overall weight for each patient. Robust sandwich estimators were used to estimate the 95% confidence intervals in order to account for the weights. Potential effect measure modification of age (categorized as <60 years old and ≥ 60 years old), tu-

Table 1 Crude and standardized risk ratios comparing immediate post-mastectomy breast reconstruction (PMBR) across year of diagnosis.

	Crude		Standardized[a]	
	PMBR, %	RR (95% CI)	PMBR, %	RR (95% CI)
Year of Diagnosis				
2000	14.5	ref	15.9	ref
2001	14.6	1.01 (0.96, 1.06)	15.0	0.94 (0.87, 1.03)
2002	15.0	1.03 (0.98, 1.08)	15.1	0.95 (0.87, 1.03)
2003	15.4	1.07 (1.02, 1.12)	16.6	1.04 (0.96, 1.13)
2004	17.0	1.17 (1.12, 1.23)	17.9	1.13 (1.05, 1.21)
2005	18.3	1.27 (1.21, 1.33)	19.0	1.20 (1.11, 1.29)
2006	19.3	1.33 (1.27, 1.39)	19.7	1.24 (1.16, 1.33)
2007	22.0	1.52 (1.46, 1.59)	22.7	1.43 (1.33, 1.53)
2008	24.4	1.68 (1.62, 1.76)	24.7	1.55 (1.45, 1.66)
2009	27.6	1.91 (1.83, 1.99)	27.5	1.73 (1.62, 1.85)
2010	29.2	2.01 (1.93, 2.10)	29.1	1.83 (1.71, 1.96)
2011	30.5	2.11 (2.02, 2.19)	30.8	1.94 (1.81, 2.07)
2012	32.4	2.24 (2.15, 2.33)	32.3	2.03 (1.90, 2.17)
2013	35.1	2.42 (2.33, 2.52)	34.5	2.17 (2.03, 2.32)
2014	35.2	2.43 (2.33, 2.52)	34.4	2.16 (2.03, 2.31)

Abbreviations: CI, confidence interval; RR, risk ratio; ref, reference.
[a] Stabilized inverse-probability of treatment weights (IPTW) were created adjusting for patient age, race/ethnicity, marital status, region, cancer grade, radiation treatment status, invasive disease, first cancer diagnosis, ER status, PR status, adjusted AJCC 6th T, and adjusted AJCC 6th N; inverse-probability of missing weights (IPMW) were used to account for missing race/ethnicity, ER status, and PR status variables.

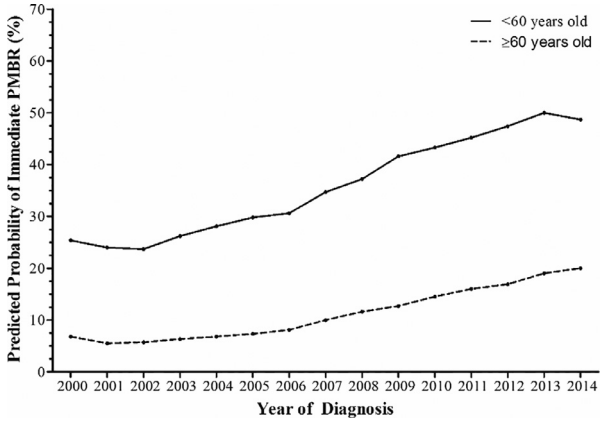

Figure 1 Predicted probability of PMBR across time, after weighting for patient and cancer characteristics, stratified by age.

mor grade and radiation therapy on PMBR trends was also assessed.

Overall, 321,206 women were included and 77,798 (24%) underwent PMBR. The majority of the patients had early-stage (AJCC 6th T1-T2, N0-N1) and ER/PR positive tumors ($n = 171{,}515$, 53%). The proportion of women undergoing immediate PMBR has consistently increased over time, with 15% of women undergoing immediate PMBR in 2000, compared to 35% in 2014 ($p < 0.0001$). After standardizing for patient and cancer characteristics over time, women diagnosed in 2014 were still over twice as likely to undergo immediate PMBR, compared to 2000 (RR 2.16, 95% CI 2.03, 2.31) (Table 1). Age also significantly influenced the change in immediate PMBR over time, $p < 0.0001$ (Figure 1). Compared to 2000, the number of women < 60 undergoing PMBR roughly doubled (25%-49%), whereas the probability of women ≥ 60 years old more than tripled (7%-20%). That being said, younger women were still significantly more likely to receive immediate PMBR in 2014 (RR 2.44, 95% CI 2.34, 2.55). Radiation status and tumor grade had minimal impact on the probability of immediate reconstruction.

Overall, the proportion of women receiving immediate PMBR after mastectomy in the US has substantially increased since 2000, potentially reflecting the effects of WHCRA; however, the majority of BC patients still do not undergo PMBR. Moreover, age was associated with the probability of undergoing immediate PMBR, with older women being significantly less likely to undergo reconstruction. Breast reconstruction has been shown to improve the quality of life and restore a healthy body image after mastectomy for the breast cancer patient.[1,2] Immediate PMBR has the advantage of a shorter recovery time, potentially improved aesthetic outcomes, and reduced surgery and recovery related costs than delayed PMBR.[1,3] Immediate PMBR has been demonstrated to be safe, even among older patients.[4,5]

In conclusion, the incidence of immediate PMBR has dramatically increased between 2000 and 2014 since the enactment of the breast cancer legislation in the US. The majority of women, however, are still not undergoing reconstruction after mastectomy. Future research is needed to further elucidate factors associated with PMBR as well as patient-provider decision making and how PMBR utilization can be further increased in an otherwise eligible population of breast cancer patients, in order to improve patient quality of life.

Conflict of interest

N/A.

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