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Correspondence and Communications

First dorsal metacarpal flap refinement for coverage of thumb defects

Dear Sir,

Thumb defects after crush injury or amputation are common. The first dorsal metacarpal flap or Foucher flap is an island flap that was described as an alternative in the coverage of the distal stump or any other tissue loss in the thumb.[1] The donor site is the skin from the dorsal aspect of the proximal phalanx of the index finger and second metacarpal head, which is usually grafted.

One of the main disadvantages of this flap is the potential morbidity in the donor site, including venous congestion of the index finger, pain derived from transection of some dorsal branches coming from the radial sensory nerve, or limitation for metacarpophalangeal flexion.

In this study, we present a new surgical technique, which is a modification of the Foucher "cerf volant" flap, to treat patients with tissue loss in the thumb proximal to the interphalangeal joint. The aims were to avoid donor site morbidity by designing an island flap over the second metacarpal head, which would allow for direct closure.

This flap was performed in 5 patients. All the cases presented with defects in the thumb proximal to the interphalangeal joint, exposing flexor or extensor tendons, bone or the neurovascular bundle. The tissue loss was not amenable to direct closure in any of the cases.

The design was marked before the surgery by performing the "pinch test" over the second metacarpal head, trying to include at least a dorsal vein within the pedicle. The skin island dimensions were among 1,5 and 2,3 cm width, and 2,5 and 3,5 long, and it was designed as spindle-shaped (Figure 1).

The flap dissection was performed under limb ischaemia. The pedicle of the flap was raised as described by Foucher, from distal to proximal up to the proximal angle of the first dorsal intermetacarpal space. The island flap was then tunneled subcutaneously through the dorsal aspect of the first dorsal intermetacarpal space and thumb until it reached the defect. The donor site was closed directly. In the postoperative period, no venous congestion or ischaemia were observed.

At 3-year follow-up, the cosmetic result was satisfactory in the thumb and in the donor site, and the functional outcomes were excellent, without any case of dorsal pain or limitation in the range of movement of the second metacarpophalangeal joint (Figure 2).

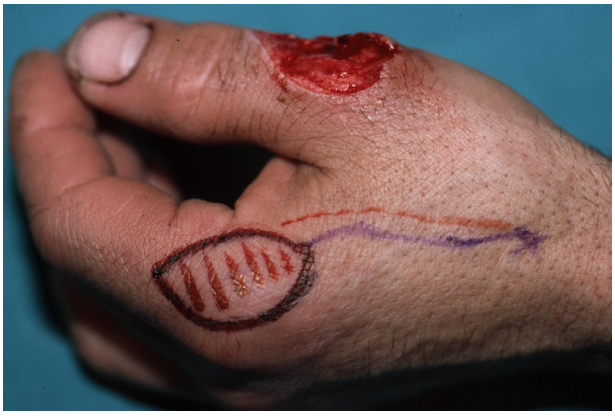

Figure 1 Preoperative surgical marking of the flap. The spindle-shaped design included the skin over the second metacarpal head. It is important to include at least a dorsal vein within the pedicle.

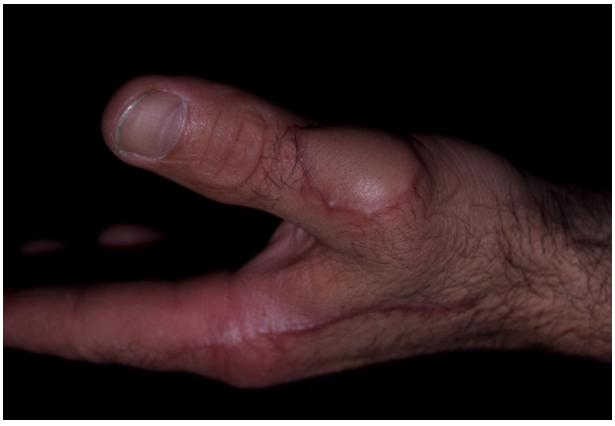

Figure 2 Postoperative results at 3-year follow-up. No donor site pain or functional limitations were observed with this technique. The cosmetic result was also pleasing.

When direct closure in thumb wounds is not an option, distal exposed bone can be covered using local flaps such as Atasoys's, Moberg or Hueston, or island pedicled flaps, such as Foucher flap or Littler flap.

The first dorsal metacarpal artery flap was first described by Hilgenfeldt.[2] Holevich described a modified adipofascial flap for osteoplastic reconstruction of the thumb, which later was modified to a skin island flap, raising the skin from

the dorsum of the first phalanx excluding the skin from the dorsum of the second metacarpal head.[3,4] Later, Foucher and Braun described the "cerf volant" flap as a similar island flap as it had already been described by Holevich.

The design of the first dorsal metacarpal artery flap as a racket flap, including skin from the dorsum of the second metacarpal head, was reported to have decreased risk for venous congestion, distal necrosis and cold intolerance than the island flap excluding the skin from the dorsum of the second metacarpal head.[5] The alleged importance of the inclusion of the skin over the metacarpal head in the design of the skin island might be explained by knowing that the area just radial to the metacarpal head is the precise spot, where a cutaneous perforator arises from the first dorsal metacarpal artery.

The modification we present precludes the need for skin grafting on the donor site, but the tissue loss must be proximal to the interphalangeal joint of the thumb. The two cases reported did not suffered from venous congestion, distal necrosis of the flap or cold intolerance.

When the tissue loss is proximal to the interphalangeal joint, and bone, tendon or neurovascular bundles are exposed, Foucher island flap is a useful tool, with the limitations of the donor site morbidity. The modification we present allows for a direct closure of the donor site, leading to better functional and aesthetic outcomes, and also remaining as a safe, quick and useful flap for the emergency setting.

Conflicts of interest

None declared.

Disclosure of funding

None.

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Microscope assisted surgery for dupuytrens disease

Dear Sir,

The traditional surgical management for Dupuytrens Disease (DD) is a limited fasciectomy.[1] Surgeons will often use magnification in the form of surgical loupes to dissect out the fibrous cord from the neurovascular structures in the palm and digit. Authors have described an up to 7.8% risk of neurovascular injury in DD.[2] This can be higher in recurrent disease as often the neurovascular structures are encased in scar tissue and surgical planes are hard to determine.

To limit the risk of neurovascular injury; we have adopted a microscope assisted approach to fasciectomy in specific scenarios, such as in cases of recurrent disease. We have found this useful in primary cases where pretendinous and abductor/lateral cords coalesce to encase the neurovascular structures distal to the proximal interphalangeal joint crease. Furthermore, in primary disease releasing periarticular DD is made more straightforward with microscope dissection. The disease affecting the Cleland ligaments around the PIPJ can be better identified[3] and it is the thickened Cleland's cord that restricts PIPJ extension. Microscope dissection facilitates easier dissection and identification of Clelands ligaments that need to be excised and thus limits the need for sequential PIPJ release.[4] Another advantage is better visualization of the dorsal branch of the digital nerve, which can be easily injured.

Microscope assisted dupuytrens dissection (*Zeiss OPMI Vario700 10× Magnification*) was used in 17 cases over the course of 3 years (2015–2018). 17 cases were in recurrent disease, all 17 of these cases underwent dermofasciectomy. There were no cases of ischemia and no reported cases of iatrogenic nerve injury.

The technique included starting the dissection with 2.5× loupes in a proximodistal direction; identifying the NV structures first under the transverse Skoog fibres. In primary disease it is unnecessary to use the operating microscope in the palm or digit as the nerve can easily be dissected free from the palmar pretendinous cords. However in the digit it may be needed particularly where the ulnar neurovascular bundle of the small finger is encased by the conversion of the abductor and central cords.

In recurrent disease, the microscope may need to be used sooner in the palm to provide a detailed view of the neurovascular structures. When under loupe magnification it is hard to proceed with dissection of the cords, we bring in the microscope. This can facilitate an easier and safer, and often quicker, dissection due to easier identification of the neurovascular structures and the plane of dissection that usually exists, between these structures and the recur-

rent disease/scar tissue and extra control is achieved with magnification. Often dissection is possible without specific microsurgical instrumentation but, on occasion, jewellers forceps and micro scissors are used to dissect the cord free of the NV bundle. The assistant provides counter traction under the microscope to facilitate easier dissection of the cords. Under the microscope one can also record and photograph on the operation note the extent the disease for the patients and which specific cords were involved (lateral, central, and spiral). Furthermore, the surgical scrub team can follow what is happening on the monitor.

Many may argue that microscope assisted fasciectomy is slow and cumbersome; however, if its requirement is anticipated, the preparation downtime is minimal as the surgeon can usually continue to operate until the microscope is ready and the enhanced detail usually allows for a quicker dissection of the involved tissues. The mean operative time in our series of 17 patients was 189 min.

We recommend that hand surgeons consider the use of the operating microscope particularly when the (1) digital cords encase the NV bundles in primary disease (2) in recurrent disease where no planes can be identified and all structures are encased in dense scar tissue (3) In patients who have had previous vascular injury to one of the digital arteries and a positive digital Allens test is identified.

We are the first to report this microscope assisted technique for recurrent Dupuytrens in the literature and have demonstrated reduced risk of neurovascular injury in a case series of 17 patients. This figure is in contrast to a nerve injury that ranges from 1.5% to 7.8% in the literature and arterial transection of 0.8–9.8% in the literature.[2]

Conflicts of interest

None.

Funding

None.

Ethical approval

N/A.

Level of evidence

4.

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Should we be imaging soft tissue masses of the hand and wrist?

Dear Sir,

Soft tissue masses of hand are common. High resolution ultrasonography (US) and magnetic resonance imaging (MRI) play a role in guiding management.[1] There are no studies evaluating benefits of US and/or MRI in clinical practice compared to pre-operative clinical assessment by the operating surgeon. In this study, we examine the relationship between pre-operative clinical diagnosis, radiological diagnosis (US and MRI) as well as histopathological findings of soft tissue hand lesions.

A retrospective review of patients undergoing excision of soft tissue hand masses between 2015 and 2018 in our department was conducted. Pre-operative clinical diagnosis was reported by the consultant surgeon at the time of initial consultation prior to imaging. The radiological diagnosis was US and/or MRI as reported by a specialist musculoskeletal consultant radiologist. All patients underwent an excision of the mass for histological evaluation. The standard of reference was the histopathology result, as reported by a consultant in histopathology in all patients. The pre-operative clinical diagnosis and radiological diagnosis were compared with histopathology results to determine accuracy of diagnosis.

Sixty two patients (female: male ratio 2:1) with a mean age of 50 years (range 17 to 84 years) were included. Thirty one patients underwent pre-operative imaging with US ($n = 24$) or MRI ($n = 16$) or both ($n = 9$). The correct diagnosis was achieved on US in 58% cases; incorrect in 29% cases and non-diagnostic in 13% cases. US was accurate in diagnosing conditions such as ganglions (75%) and vascular malformations (VMs) (75%), whilst other conditions such as giant cell

Table 1 Distribution of different hand soft tissue masses.

Diagnosis	Number of cases (%)
Ganglion	23 (37%)
Fibroma	8 (13%)
GCT	6 (10%)
Vascular malformation	4 (7%)
Glomous tumour	3 (5%)
Gout	3 (5%)
Lipoma	2 (3%)
Epidermal cyst	2 (3%)
Mucous cyst	1 (2%)
Other	10 (16%)

tumours (GCTs) were diagnosed with lower accuracy (50%). MRI achieved the correct diagnosis in 65% of cases; incorrect in 29% cases and non-diagnostic in 6% cases. MRI was 100% accurate in diagnosing ganglions and GCTs 60% of the time. The pre-operative clinical diagnosis matched the histological diagnosis in 15 of 27 patients (56%), where documented. The percentage was high for lesions such as ganglions (73%) and lower for conditions such as fibroma (50%) or granuloma (50%). Twelve patients had pre-operative clinical diagnosis stated in addition to undergoing imaging. In this subgroup, clinician reported and histological diagnosis was the same in 50% of cases, which was identical to the accuracy of US and but lower than for MRI (67%).

The distribution of soft tissue masses in our study (Table 1) is similar to that reported in the literature.[2] In our study overall accuracy of US when compared to histological findings was 58%, which is similar to previous published data.[3] In our cohort, US was accurate in diagnosing ganglions 75% of the time which is comparable to previous published reports which vary from 39% to 87%.[3]

In our study the accuracy of MRI was lower than reported by Agarwal et al.[1] Capelastegui et al.[2] report in their study of 134 cases that MRI provided a diagnosis for the soft tissue mass in 94%. The histopathological diagnosis was only available for a 34% of their cases but they considered MRI alone diagnostic for the remaining larger proportion. Our low accuracy of MRI could be explained by the fact that only 26% of our cohort had an MRI scan. This was ordered by the clinician for cases where the diagnosis was not straightforward. The accuracy of diagnosing conditions for which MRI is considered diagnostic, such as ganglions[2] was as high as 100% in our cohort, whilst the accuracy of diagnosing other conditions such as GCTs was 60%.

Clinicians are more likely to image soft tissue masses where there is diagnostic uncertainty. Agarwal et al.[1] report radiological and pathological correlation in 35 patients, all of whom underwent both US and MRI and concluded that in most conditions, imaging findings are nonspecific and diagnosis rests on pathologic evaluation. We looked at the clinical correlation in addition to the radiological diagnosis and the accuracy of imaging is not superior to clinical diagnosis alone. In a high proportion of cases the diagnosis rests on pathological evaluation. For the twelve patients who had a reported clinical diagnosis in addition to imaging the results were identical to USS at 50% and slightly lower than MRI (67%). In particular the accuracy of clinical diagnosis for ganglions was similar to USS (73 versus 75%) suggesting that imaging for ganglion has little advantage over clinical diagnosis alone. Conditions, in our study, where there was considerable discrepancy between the clinical and pathological diagnosis such as fibromas or granulomas (50% accuracy), are reported to have similarly low sensitivities of 12.5% and 58%, respectively by MRI.[4]

This study demonstrates the correlation between clinical diagnosis, radiological findings and histopathological diagnosis of soft tissue masses of the hand. MRI and US provide accurate diagnosis for some soft tissue lesions of the hand but clinical diagnosis is as accurate in most cases.

Conflict of interest

Authors have no conflicts of interest to declare.

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Reply to: "Updated guidelines on complex regional pain syndrome in adults"

Dear Sir,

We read with interest the article by Dr. Henderson "Updated guidelines on complex regional pain syndrome in adults."[1] The article provides an elegant summary of the Royal College of Physicians (RCP) current guidelines in the diagnosis and treatment of complex regional pain syndrome (CRPS) and recommends surgical intervention for the treatment of Type 2 CRPS (i.e. CRPS with a recognized nerve injury). However, it fails to identify the timing of such interventions. This is important considering the emerging paradigm shift in concepts of nerve pain, specifically 'centralization' of pain in neuroma patients with delayed presentations. We reviewed published articles on Type 2 CRPS patients with an emphasis on treatment timing. A PubMed database search and a systematic review of surgical treatment for Type 2 CRPS in the upper extremity published between 2000 and 2018 was conducted.[2-6] Treatments were categorized in 5 groups: (1) Dorsal Sympathectomy after good response to Stellate Ganglion Block (SGB)[2,3]; (2) Dorsal Sympathectomy after poor response to SGB[2,3]; (3) Peripheral Sympathectomy[4]; (4) Nerve Decompression[5]; (5) Nerve Reconstruction with Neuromodulation[6] (See Table 1). This analysis yielded 94 cases with a mean age of 41 ± 18 years; male to female ratio was 1.6:1 with a mean follow-up of 28.4 months. The mean time to surgical intervention and pain relief are noted in Table 2 below. Pain relief was noted to be highest in Group 1 and Group 4 (100%), intermediate in Group 3 and Group 5 (75%); and lowest in Group 2 (65.7%). This suggests that earlier surgical intervention is superior in patients with Type 2 CRPS. Notably, response to Stellate Ganglion Block appears to be a positive predictive indicator to the efficacy of subsequent Dorsal Sympathectomy.

Group 4 is a special subset of patients with Type 2 CRPS secondary to nerve compression, and the data suggests early nerve decompression within 6 weeks of the injury yields the best results. Interestingly, late presentations of Type 2 CRPS seem to have a 'centralization' of pain similar to neuroma patients as seen in Groups 3 and 5. These cases therefore respond best with Peripheral Sympathectomy or Nerve Reconstruction with Neuromodulation. Overall our literature review lends credence to the overarching concept that nerve injury is best recognized and treated early and that late presentations are associated with 'centralization' of pain. While we agree with Dr. Henderson that amputation is a poor treatment option, we respectfully disagree that it should be considered even after 24 months, since the data suggests 'centralization' of pain has occurred by then and amputation is highly unlikely to cure pain.

Table 1 Treatment groups based on surgical intervention of type 2 complex regional pain syndrome. (SGB = Stellate Ganglion Block).

Group	Intervention
I	Dorsal Sympathectomy (+) Response SGB
II	Dorsal Sympathectomy (−) Response SGB
III	Peripheral Sympathectomy
IV	Nerve Decompression
V	Nerve Reconstruction with Neuromodulation

Table 2 Time to surgical intervention and pain response of type 2 complex regional pain syndrome patients in each treatment group. (DS = Dorsal Sympathectomy, SGB = Stellate Ganglion Block, PS = Peripheral Sympathectomy, ND = Nerve Decompression, NR + NM = Nerve Reconstruction with Neuromodulation).

Group	Mean Time to Intervention (Months)	Pain Response (%)
I: DS (+) SGB	3	100
II: DS (−) SGB	3	66
III: PS	28.8	75
IV: ND	1.5	100
V: NR + NM	24	75

And finally, the guidelines recommend delaying elective limb surgery in patients afflicted with CRPS until at least 12 months after resolution of acute symptoms, since less than 15% of these patients experience a recurrence after that. We would like to add that increasing data supports the use of Vitamin C as a preventative modality and should be considered in all patients with prior history of CRPS undergoing subsequent limb surgery.

We would like to thank Dr. Henderson for his excellent review of the RCP guidelines and hope that further outcomes research regarding surgical management of Type 2 CRPS and its timing will improve our practice and lead to further refinement of existing practice guidelines.

Signing by Zeiderman & Pereira

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Response to "Reply to: Updated guidelines on complex regional pain syndrome in adults"

Dear Sir,

I thank Drs Zeiderman and Pereira for their kind words and constructive comments. The Royal College of Physicians guidelines do not absolutely recommend surgery for all cases of type II CRPS, but recognize that it might be appropriate where nerve injury or entrapment are confidently diagnosed (e.g. with nerve conduction tests).

Their systematic review of treatment for type II CRPS is interesting, and the conclusions very logical, but as many conditions improve with time and conservative measures, a randomized controlled trial is required to fully answer the question of when to do surgery. This would be the logical progression following a systematic review of the currently available literature.

I agree that amputation cannot be expected to cure pain in CRPS. The only definite indication for amputation is intractable infection; patients may be pleased to lose a suppurating malodorous and non-functioning limb, even if their pain persists or worsens. Some authors however report results from amputation that are not entirely negative[1], or where amputees seemed to do better than those in whom amputation was considered but not performed[2]. With the exception of infection requiring prompt treatment, or possible nerve surgery as above, delaying surgery is recommended to minimize the risk of recurrence[3].

Evidence is emerging for the prophylactic value of vitamin C, but at the time of publication, the level of evidence was found to be insufficient for this to be included in the guidelines. Hopefully further work will clarify the situation, as vitamin C is cheap, safe, and may have other health benefits.

Yours Sincerely

James Henderson

Conflict of interest

None.

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ALT vs. Jejunum: Have we found the ideal flap for circumferential pharyngoesophageal reconstruction? A meta-analysis of comparative studies

Dear Sir,

Free flap reconstruction has become the preferred procedure for circumferential pharyngoesophageal defect. Among the free flaps used, free anterolateral thigh (ALT) flap and free jejunal flap are the two most popularly used flaps. The choice of flap usually depends on the surgeon's training and experience. There are limited studies that directly compared the clinical and functional outcomes with

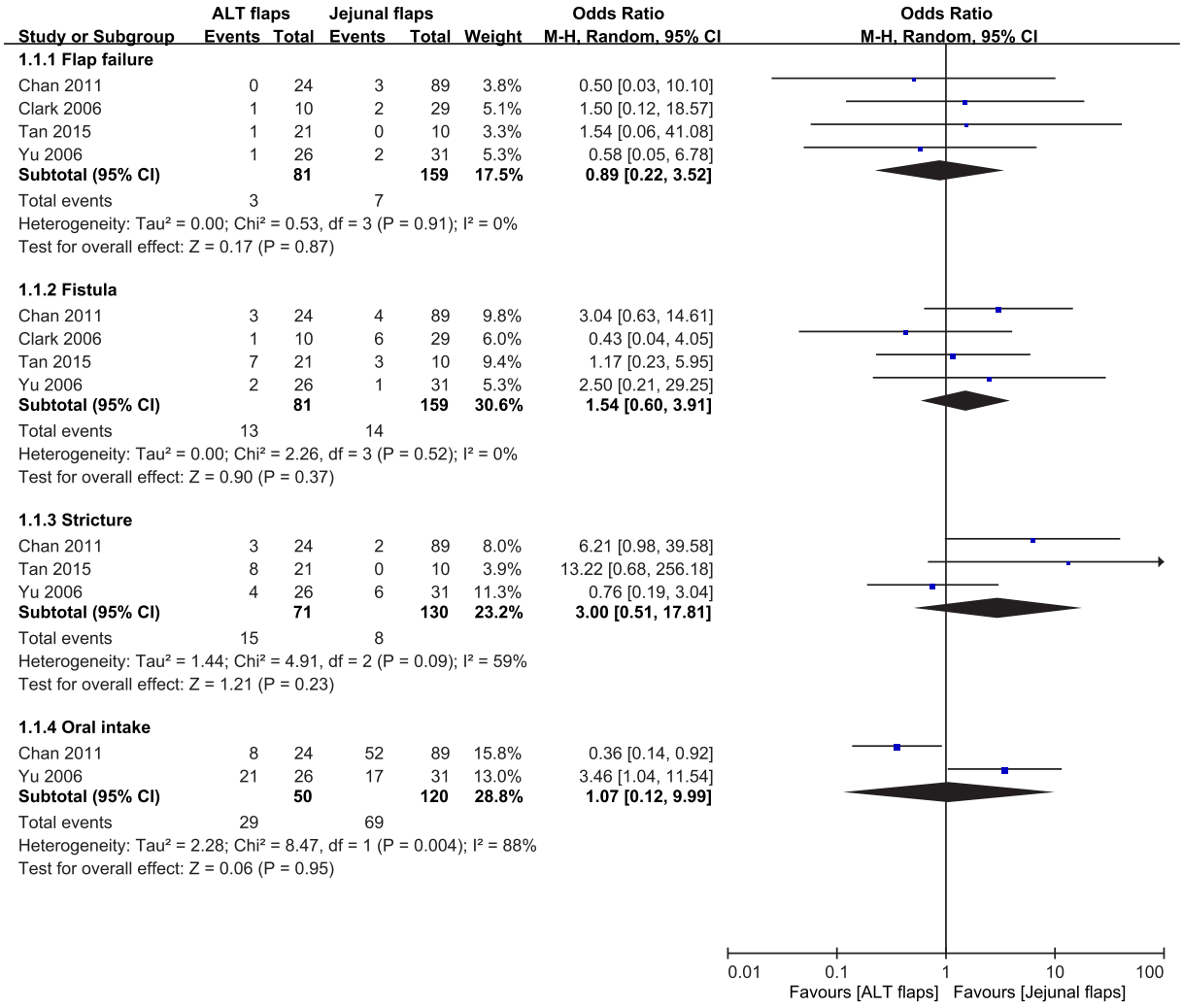

Figure 1 Forest plots demonstrating the odds ratio of ALT flap group versus jejunal flap group in terms of flap failure, fistula, stricture, and oral intake with random effects model meta-analysis. M-H, Mantel-Haenszel.

these two flaps. We conduct a systematic review and meta-analysis to compare the postoperative complications and the functional outcomes after reconstruction of circumferential pharyngoesophageal defects using free ALT flap versus free jejunal flap.

PubMed/MEDLINE, EMBASE, and SCOPUS databases were searched for studies published through September 2018. Publications that met the following criteria were included: (1) adult patients (> 18 years) undergoing circumferential pharyngoesophageal reconstruction; (2) comparison of free ALT flap and free jejunal flap for circumferential pharyngoesophageal reconstruction; and (3) documentation of postoperative complications and functional outcomes. Outcomes analyzed included incidence of complete flap failure, fistula, stricture, return to oral intake, and regained speech. Pooled odds ratios (OR) with 95% confidence intervals (CI) were obtained through meta-analysis.

Through our literature search we identified four retrospective comparative studies,[1-4] including 81 patients undergoing free tubed ALT flap reconstruction and 159 patients receiving free jejunal transfer for circumferential pharyngoesophageal defects. (Table 1) The pooled meta-analysis of the four comparative studies showed that there was no statistically significant difference in the incidence of flap failure (3/81, 3.70% versus 7/159, 4.4%; OR = 0.89, 95% CI, 0.22 to 3.52; P = 0.87) and the percentage of patients return to oral intake (29/50, 58.0% vs. 69/120, 57.5%, OR: 1.07; 95% CI, 0.12 - 9.99; P = 0.95). However, the use of free ALT flaps tended to increase postoperative complications in fistula (13/81, 16.0% vs. 14/159, 8.8%, OR = 1.54; 95% CI, 0.60 to 3.91; P = 0.37) and stricture (15/71, 22.2% vs. 8/130, 6.2%, OR = 3.00; 95% CI, 0.51 - 17.81; P = 0.23) though the result was not statistically significant. (Figure 1).

Free ALT flap has become a popular reconstructive procedure for circumferential pharyngoesophageal reconstruction. With the substantial statistical and clinical heterogeneity, our findings indicated the tendency of increased postoperative complications in fistula and stricture by using free ALT flaps. Additional high-quality trials are warranted to corroborate the findings of this meta-analysis.

Table 1 Included comparative studies analyzing complications and functional outcomes between ALT flaps and jejunal flaps.

Study	Country	Patient #		ALT flaps					Jejunal flaps				
		ALT	JJ	Complete failure (%)	Fistula (%)	Stricture (%)	Oral intake (%)	TE speech (%)	Complete failure (%)	Fistula (%)	Stricture (%)	Oral intake (%)	TE speech (%)
Yu (2006)[1]	USA	26	31	1 (3.8%)	2 (7.7%)	4 (15.4%)	21 (80.8%)	8 (30.7%)	2 (6.5%)	1 (3.2%)	6 (19.4%)	17 (54.8%)	2 (6.5%)
Clark (2006)[2]	Canada	10	29	1 (10.0%)	1 (10.0%)	3 (30.3%)	N/A	N/A	2 (6.9%)	6 (20.7%)	N/A	N/A	N/A
Chan (2011)[3]	HK	24	89	0 (0%)	3 (12.5%)	3 (12.5%)	8 (33.3%)	N/A	3 (3.4%)	4 (4.6%)	2 (2.3%)	52 (58.4%)	N/A
Tan (2015)[4]	Taiwan	21	10	1 (4.8%)	7 (33.3%)	8 (38.1%)	N/A	N/A	0 (0%)	3 (30.0%)	0 (0%)	N/A	N/A
Total		81	159	3 (3.70%)	13 (16.0%)	18 (22.2%)	29 (58.0%)	8 (30.7%)	7 (4.4%)	14 (8.8%)	8 (6.2%)	69 (57.5%)	2 (6.5%)

Abbreviations: ALT, anterolateral thigh flap; JJ, jejunum; TE Speech: tracheo-esopageal Speech.

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Authors' contribution

Tony Chieh-Ting Huang, M.D., M.Sc.: Concept design, drafting, revision, and approval of final manuscript to be submitted. Hsu-Tang Cheng, M.D.: Concept design, drafting, revision, and approval of final manuscript to be submitted.

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Minimal invasive laparoscopic harvest of the greater omental flap for Fournier's gangrene scrotal reconstruction

Dear Sir,

Aggressive surgical debridement is often warranted for patients with Fournier's gangrene, which result in extensive defects[1]. Many methods have been described for the coverage of these kind of defects including free and pedicled myocutaneous, fasciofucaneous, and also the greater omental flap (GOF)[2,3]. The aim of this letter is to present for the first time, the laparoscopic harvest of GOF for complete scrotal reconstruction in a patient with Fournier's gangrene.

An 18 year-old male previously diagnosed with Fournier's gangrene of the scrotum and lower abdomen defect post-surgical debridement presented to our outpatient clinic. He was experiencing recurrent infections. After discussing all available options, the patient agreed to undergo reconstruction with a laparoscopic harvested pedicled GOF. In the operating room, the patient was place in the supine position under general anesthesia and prepped for surgery. He was further debrided to obtain fresh bleeding tissues while another team of general surgeons performed laparoscopic harvest of the GOF. To prepare for the harvest, an infraumbilical incision was made to place a 10-mm blunt trocar into the peritoneal space to achieve a pneumoperitoneum with a pressure of 10–12 mmHg. Then a camera was inserted and two additional 5-mm trocars were placed in the right abdomen with one above the level of the umbilicus and the other one below. By carefully ligating the omental vessels from the left gastroepiploic vessels, the omentum could be separated from the greater curvature of the stomach and also the transverse colon to be based on the right omental vessels from the right gastroepiploic vessels. The GOF was then brought to the surface to the perineal region by tunneling it through the inguinal canal, which follows the pathway of an indirect inguinal hernia. The omental flap was used to cover areas of scrotal skin defect. (Figure 1) After swelling decrease, seven days later, the flap was then layered with split-thickness skin graft taken from the right lateral thigh. The postoperative course was uneventful and the patient was discharged on the 4th day. At 2-year follow-up, the flap and skin graft survived completely with good healing and normal appearance and texture of the scrotum. No complication was reported during the period of follow-up. (Figure 2)

The choices for scrotal reconstruction are often depend on surgeon's experience and patient preference. Reported options include local pudendal thigh flap, pedicled TUGPAP flap, direct split-thickness skin graft, and pedicled omental flap via the laparotomy approach. The GOF is advantageous for this purpose; it offers low donor site morbidity when minimal invasive surgery such as laparoscopic or robotic techniques are applied, better resembling of the native scrotal skin, and is highly pliable for to enable an optimal thickness for thermal regulation of the testes[2].

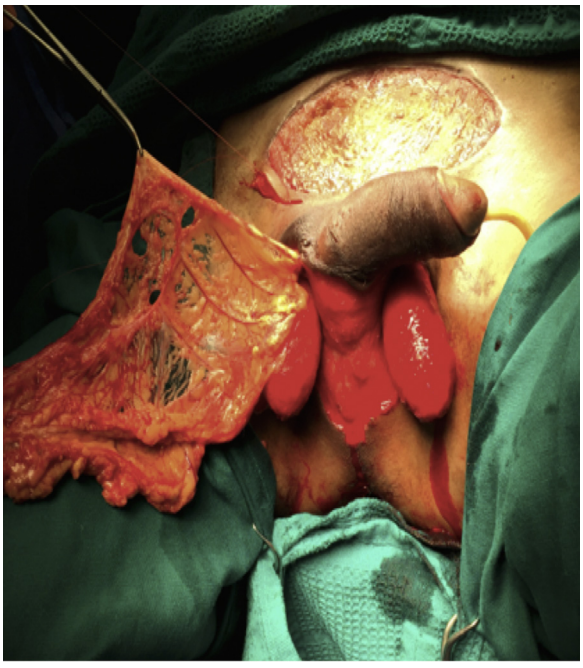

Figure 1 The reconstruction of scrotal and lower abdominal defects of an 18 year-old patient. Picture showed after laparoscopic harvest of the omental flap, the flap was tunneled to the defect via the inguinal canal.

Figure 2 At 2 years follow-up, picture showed good results and resemblance to the native scrotal skin.

However, disadvantages of this technique includes the possibility of future inguinal hernias and also minimal risk of injuring intra-abdominal organs during the laparoscopic harvest of omentum. Nevertheless, with the combination of a laparoscopic harvest, the procedure becomes minimally invasive and further improves donor site morbidity.

Conflict of interest

None of the authors received any funds or has any financial interests to disclose.

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Single use negative-pressure wound therapy: Are we being sucked in?

Dear Sir,

Single use negative pressure wound therapy (NPWT) devices (PICO™ Smith and Nephew and Prevena™ Acelity,) have been marketed as a significant advancement in wound care providing a more comfortable and user-friendly experience than their cumbersome re-usable competitors.[1] A small, light weight pump, powered by batteries, and small enough to fit easily into a pocket, unobtrusively delivers 80mmHg (PICO™) or 125mmHg (Prevena™) of continuous negative pressure.

Recently published NICE guidance on PICO™ concludes that it reduces surgical site complications, particularly infections, when used over closed surgical incisions, but remains equivocal regarding its use in non high-risk patients when the cost is compared to the current standard of care; regular dressings.[2] Notably, of the two supporting publications cited by NICE, a meta-analysis[3] and a prospective RCT[4] were both industry funded, and two of the specialist advisors called on by NICE have links with the retailer, Smith and Nephew.

The second elephant in the room however, remains a peculiarity of the devices themselves which has seemingly evaded attention in the literature and by NICE. Both have an average life span of only one week, and as little as two days,[5] a weakness that has been framed positively as "single use", facilitating rapid dispensation "off the shelf". For PICO's price tag of £127-145 (one device with two dressings), and a likely treatment course of several weeks for many patients,[5] several separate devices must be utilized. Why should the device become intrinsically defunct after only one week's use, notwithstanding changeable batteries?

The concept of built-in obsolescence in consumer products has been well established since the 1930s, and has been criticized as a strategy used by oligopoly companies to increase their revenue. A product is designed with a predetermined life span, after which the consumer must make a further purchase of the same product, or its successor, to continue use.

Innovative as the PICO system may be, the system becomes useless unless a new device is fitted. There is as yet no suggestion of replaceable parts, and no explanation in the product's user guide, or manufacturer's website, as to why its usage should be so limited.

To investigate this further we opened up a deceased PICO pump and identified the internal components to be a circuit board, a vacuum pump measuring 4×2cm, protective foam padding, and wiring connecting the battery (Figure 1). When the pump was disconnected from the circuit board

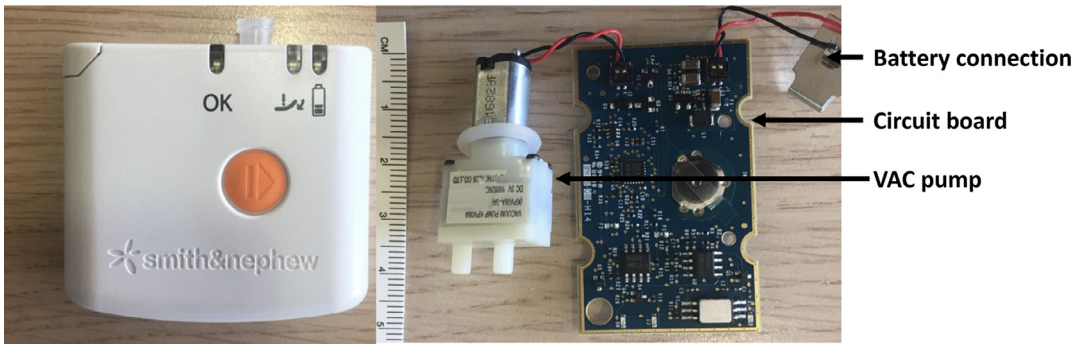

Figure 1 Dismantling of PICO device illustrating circuit board, battery connections and VAC pump.

and connected directly to its power source (two AA batteries), the previously defunct component returned to working order. We therefore surmise that in some way the device is programmed to 'die' within 1 week. One legitimate explanation might be that the material components of the device become worn out or unreliable after a prescribed time, and cannot be guaranteed thereafter to deliver the stated negative pressure.

However, we would urge further objective, independent investigation and more rigorous oversight by the regulatory body, to ensure that health services are receiving value for money, and not falling victim to shrewd marketing.

Conflict of interest

None

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None

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Achieving clear margins: Review of techniques to more accurately delineate basal cell carcinoma (BCC) macroscopic border prior to excision biopsy

Dear Sir,

Basal cell carcinoma (BCC) is the most common skin cancer worldwide, and a large proportion are amenable to removal by excision biopsy under local anaesthetic with predetermined margins. This article reviews the techniques reported in the literature to assist surgeons in achieving this aim (Table 1).

It is clearly very important for surgeons performing excision biopsy to adequately define the macroscopic extent of tumour and hence peripheral margins, to minimize risk of incomplete excision. Tumour clearance can be achieved for 95% of small (< 2 cm) well-defined BCCs with 4 mm peripheral margin, whilst primary morphoeic, ill-defined BCCs,

Table 1 Reported techniques for defining BCC macroscopic margin.

Reference	Test
[2]	BCC Stretch test
[3]	Reverse stretch test
[4]	Topical Alcohol wipe test
[5]	Curette BCC surface

usually require considerably greater peripheral margins to achieve similar clearance rates.[1]

A proportion of BCCs are macroscopically ill defined, such as some superficial, morpheaform, infiltrative, and micronodular subtypes. British Association of Dermatologists (BAD) guidelines[1] recommend that high risk BCCs, and recurrent BCCs in cosmetically or functionally critical sites such as the central face should undergo Mohs' Micrographic Surgery (MMS). MMS is a limited resource in the UK and tends to be available as a regional service in tertiary referral centres only.

The stretch test for BCC[2] peripheral margin determination is an aid to clinical diagnosis and delineation of macroscopic extent of the tumour; stretching the skin empties the tumour microcirculation of erythrocytes, exposing tumour stroma that delineates its characteristic pearly border.

The 'basal cell blanche' is a reported variant of the stretch test, applied to achieve skin stretching in more challenging anatomical sites such as the nasal ala (use of a cotton tip applicator applied against the nasal ala internally).

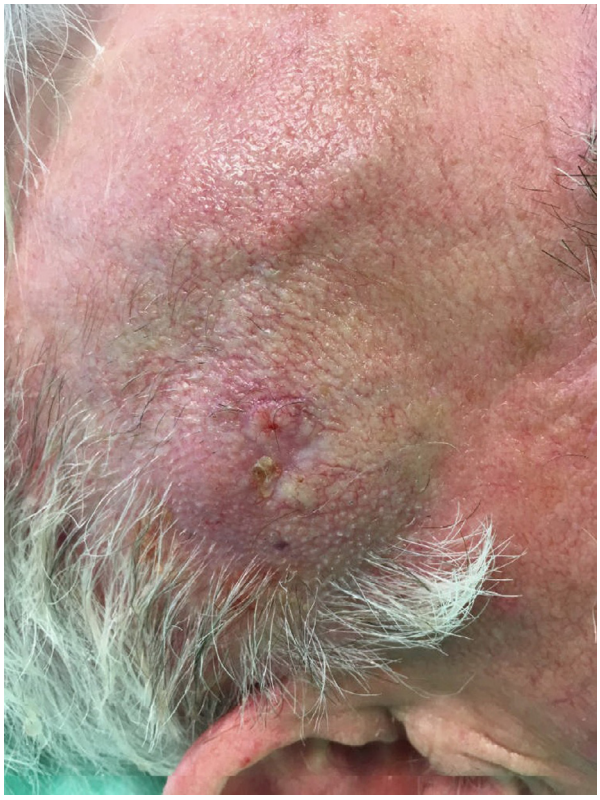

Figure 1 Indistinct BCC margins.

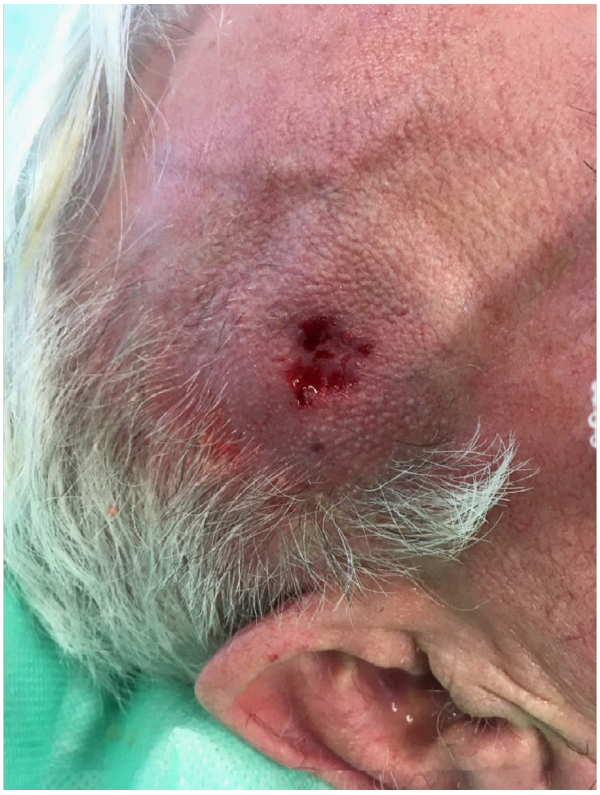

Figure 2 BCC curetting post LA administration with well-defined BCC borders.

Furthermore, the reverse stretch test has also been[3] proposed; pinching the skin with thumb and index finger just beyond the presumed border of the BCC better defines the macroscopic border as normal skin slides towards the tumour given its pliability, whilst the thickness of the tumour-laden border fails to fold.

More recently, application of isopropyl alcohol 70% topical wipe for 15–30 s to aid in diagnosis of superficial BCCs has been reported.[4] The vague indistinct erythematous or pink discolouration of the tumour is accentuated, as are the dermoscopic features, demonstrating arborizing telangiectasia.

The senior author's preferred technique is curettage of the BCC tumour surface and adjacent skin; this is a validated method to demonstrate more clearly the extent of tumour and for obtaining clear margins in BCC excision.[5] It abrades discohesive tumour cells at the skin surface, inducing bleeding from the tumour bed (Figures 1 and 2). This should preferably be performed with a blunt curette or spoon, as a sharp-ended one may gouge the tumour bed, resulting in subsequent uneven tumour depth excision. The distinction between bleeding and non-bleeding adjacent skin can be used to define the macroscopic border of the tumour, facilitating more informed marking of the peripheral excision margins.

The use of the above techniques alone or in combination should assist surgeons in obtaining greater clearance rate particularly of ill-defined high risk BCCs.

Conflict of interest statement

The authors of have no conflicts on interest to declare.

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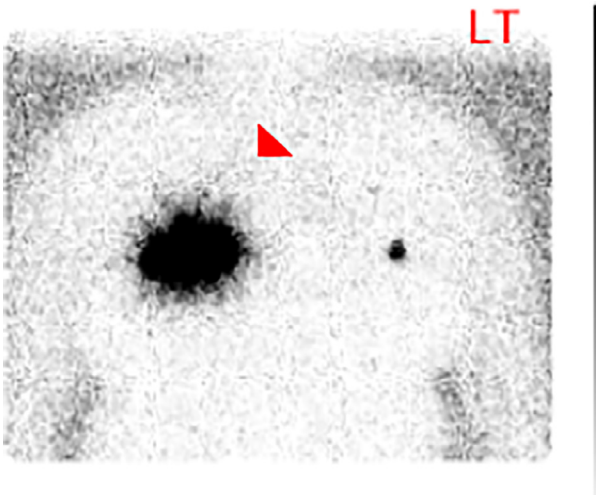

Figure 1 Anterior (229 kV range). Lymphocintigraphy demonstrated a single radioactive spot at a depth of approximately 3 cm in the contralateral axilla. Arrowhead indicates the injection site.

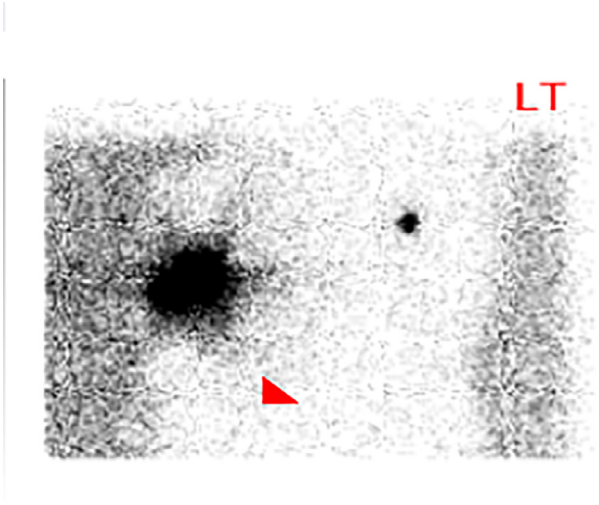

Figure 2 Left interior ablique (125 kV range). Arrowhead indicates the injection site.

Altered lymphatic drainage in malignant melanoma after previous sentinel node biopsy in the same nodal drainage basin

Dear Sir,

We would like to present the case of a melanoma patient with altered sentinel lymph node drainage on repeat sentinel lymph node biopsy (SNB) subsequent to previous breast cancer. A 53-year-old lady underwent a wide local excision (WLE) of a melanoma scar from her right breast with lymphoscintigraphy. She had a completely excised superficial spreading malignant melanoma (SSMM) of Breslow thickness (BT) 3.7 mm with ulceration. She had a history of right breast carcinoma diagnosed in 2009, treated with lumpectomy and radiotherapy, and had undergone a previous negative sentinel lymph node biopsy of the right axilla.

Lymphoscintigraphy demonstrated a single radioactive spot at a depth of approximately 3 cm in the contralateral axilla (Figures 1 and 2). There was no drainage to the right axilla.

Beasley et al. has confirmed both the efficacy and utility of repeat SNB in melanoma patients.[1] As is the case for recurrent breast cancer patients, repeat SNBs have been shown to be technically feasible in patients with recurrent or in-transit melanoma who underwent SNB at the time of their primary diagnosis. A retrospective review by Miranda et al. examined a cohort of patients undergoing repeat SNB for cutaneous tumours following axillary lymph node dissection. Lymphatic drainage was either altered or not observed in 43% of patients, emphasising the importance of pre-operative lymphoscintigraphy.[2]

In the case of metastatic melanoma which potentially drains to a nodal basin, one should still consider lymphoscintigraphy and SNB. Lymphoscintigraphy may be the only way to identify lymph nodes that would otherwise be overlooked and plays a vital role in planning further surgical intervention.

Conflict of interest

None.

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Letter to the Editor – Sentinel lymph node biopsy in melanoma: Which hot nodes should be harvested and is blue dye really necessary?

Dear Sir,

We read with great interest the article by Dr. Ranson et al.[1] about sentinel lymph node (SLN) biopsy in melanoma, whether blue dye should be used, and which hot nodes should be harvested.

Sentinel lymph node biopsy (SLNB) is generally recommended for intermediate-thickness (1–4 mm) melanomas; however, the application of this technique has recently been extended to thinner lesions too. Sentinel lymph node (SLN) status is an important prognostic factor for survival for patients with primary cutaneous melanoma.

The principles of SLN biopsy were developed by Morton et al.[2] The procedure as initially performed used a vital blue dye, 1% isosulfan blue that was injected intradermally around the primary melanoma.[2] After a brief period the "blue" node was excised and sent for a pathological analysis. The success in identifying the SLN was 89% in the groin, 81% in the neck, and 78% in the axilla.[2] The SLN biopsy technique was further refined by the addition of radioisotope technetium Tc 99m sulfur colloid96 to identify the sentinel node. This way the ability to find the SLN was increased to 96%[3].

The paper[1] states that a vital dye was injected intradermally into the melanoma scar. Since the scar has no dermis, the dye should be injected around it. The result section is a bit unclear, and authors stated that in positive nodal basins not all hottest nodes were positive, and only 84% of positive nodes were blue. In Table 1 it is unclear how there are 107 nodes harvested, while in Figure 1 113 nodes are referred to. Furthermore, there are 14 patients (2, 6%) with 3 or more positive sentinel lymph, which can be regarded as a failure of sentinel lymph node technique. It was stated in the discussion that had no positive nodes would have been missed and no basins understaged if only radioactive colloid had been used, while in the results the authors state that three patients were excluded as intra-operative radioactivity was not recorded. It would be interesting to know the thickness and site of melanoma in 45 patients with multiple nodal involvement.

It is important to improve the accuracy of SLN biopsy to false negative rate less than 5%, which can be obtained by an experienced multidisciplinary team and using combined techniques (lymphoscintigraphy, vital dye, and hand held gamma probe).[4] Withholding the vital dye only could increase inaccuracy in SLN biopsies.

In future preoperative ultrasound could be used to replace the SLN biopsy, or minimize sampling of other non-sentinel nodes. On the other hand, ultrasound can visualize 4 mm metastasis in inguinal and neck lymph nodes, and 4.5 mm in axillary lymph nodes[5] so at this moment SLN biopsy is superior technique.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and material

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

Authors contributed to the paper evenly.

Acknowledgments

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Response to 'Sentinel lymph node biopsy in melanoma: Which hot nodes should be harvested and is blue dye really necessary?'

Dear Sir,

We read with great interest Ranson et al.s' recent publication, 'Sentinel lymph node biopsy in melanoma: which hot nodes should be harvested and is blue dye really necessary?'.[1] This article retrospectively analysed 42 nodal basins in which greater than one node had been harvested, comparing the overall sensitivity of their blue dye and radiocolloid procedures with the sensitivity that might have be achieved had, theoretically, cold blue nodes been left in situ. They state that this approach could have resulted in a 5% reduction in the number of nodes harvested with no apparent change in sensitivity. The authors concluded that "radiocolloid tracer alone is sufficient for sentinel node localisation," a conclusion also reached by Niebling et al.[2] However, before we "ditch the dye" we should consider the following.

A major advantage of blue dye, not discussed in Ranson et al.s' paper, is that it allows for quick and clear identification of radioactive nodes, which, reduces the amount of tissue taken and risk of node transection. This itself minimises anaesthetic time and theatre running costs. In the senior author's experience, the blue dye facilitates sentinel lymph node biopsy (SLNB) when there has been technical difficulty in radioactive dye administration, resulting in very low signals. This provides an effective back up as blue dye alone is 84% sensitive.[2]

Ranson et al. state that anaphylaxis to blue dye occurs in 1% of cases, referencing an article that looked at three cases of allergy following its administration, as well as a case report of an urticarial rash. Our experience is that hypersensitivity reactions occur far less frequently than this. In a survey of 5527 SLNBs, two adverse reactions were reported, with no cases of anaphylaxis.[3] Most reactions are mild, and easily treated intraoperatively.

Two of the 42 basins analysed by Ranson et al. were cervical. Niebling's meta-analysis did not specify the site of SLNB in the radiocolloid alone group. The head and neck is the most technically challenging[4] and in our experience of greater than 200 head and neck SLNBs, the blue dye is an important aid in localisation.

Had Ranson's et al. left cold blue nodes in situ, patients might have retained 5% more nodes on average. More work is needed to tell if this translates into any clinically meaningful difference in morbidity.

However, the false negative rate (FNR) is the area of most concern. In Niebling et al.s' meta-analysis, the FNR was over 30% greater using radiocolloid tracer alone (3.4%;

95% CI [2.6%–4.2%]) than using a combination of radiocolloid tracer and blue dye (2.6%; 95% CI [2.3%–2.9%]).[2] A more recent study quoted by Ranson et al. has a FNR of 5.5% with radiocolloid alone at 41 months follow up. Ranson et al. state that patients who were operated on between 2009 and 2015 were included in this study, we would advocate that in future, studies of SLNB sensitivity explicitly define follow-up durations. False negative results tend to increasingly manifest over a 10-year follow-up period.[5]

Sentinel lymph node status is an important indicator for the prognosis of melanoma. In the age of immunotherapy, the sensitivity of this procedure can have a tangible effect on patient survival.[5] As a consequence, any change that may affect sensitivity of the investigation and the FNR must be robustly scrutinised. Our recommendation, based on currently available literature, is to continue to use blue dye as part of the triple identification method when performing SLNB for melanoma. Ranson et al. are right to challenge our dogmatic approach, and we thank this journal for providing a platform for academic debate. Prospective, randomised trials, with cost analyses and robust outcome sets are needed, before we "ditch the dye."

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Conflict of interests

Nil.

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Response to letter commenting on the use of blue dye in sentinel lymph node biopsy

Dear Sir,

We read with interest the reply from Rudman and colleagues[1] to our publication[2] but disagree with their assertion that blue dye must be used to increase the accuracy of sentinel lymph node biopsy (SLNB) for melanoma. In our series, the use of blue dye did not improve the sensitivity of intra-operative sentinel node identification but increased the number of nodes harvested by 5%. Our findings correspond with a meta-analysis performed by Niebling et al. in 2016,[3] where pooled analysis of 66 studies showed a 99% SLN identification rate using radiocolloid without blue dye. Niebling concludes that using radiocolloid alone is the technique of choice for experienced surgeons. Two subsequent studies have concurred.[4,5]

Rudman and colleagues also point to the role of blue dye in reducing the false negative rate of SLNB but is important to note that this is a separate issue and should not be confused with intraoperative node identification. The authors highlight a study by Veenstra et al.[6] to demonstrate that triple identification (blue dye, lymphoscintigraphy and gamma probe localisation) can help to reduce the false negative rate. This series was from 1993 to 2008, reporting a false negative rate of 5.7%, which is comparable to other series where only radiocolloid was used.[4] Veenstra et al. report that half of their false negative results came in the first year after introducing the technique and conclude that increased familiarity with the procedure, multi-disciplinary collaboration, better imaging techniques and refined pathological analysis helped them to reduce their false negative rate subsequently. Whilst they did use blue dye (this series was prior to evidence challenging its use) they make no reference to this having any effect on the sensitivity of

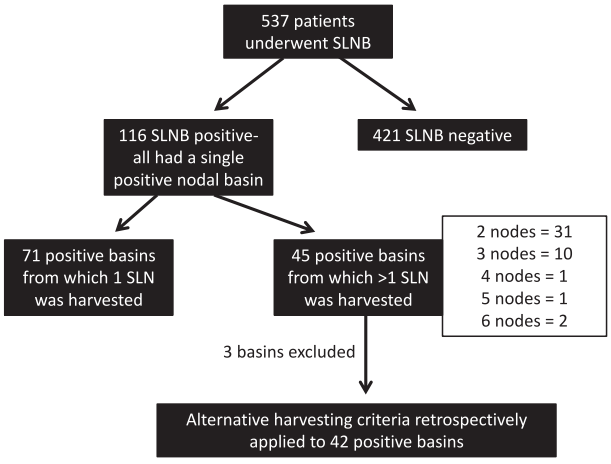

Figure 1 Methodology and inclusion criteria.

the test. Interestingly, in two of the four cases where they were able to determine the cause of the false negative error, the presumed missed lymph nodes were in fact visible on the pre-operative lymphoscintigram but were not harvested.

Although our paper does not comment on false negative rate, our own data, based on a 5-year follow-up of a concurrent cohort of SLNB patients, has shown a false negative rate (same basin nodal recurrence) of 4% using the "10% rule" and triple identification method.[7] It is unlikely that avoiding the use of blue dye will affect our false negative rate, as all of the positive sentinel nodes in our study were hot. In addition, using radiocolloid alone leads to only a modest reduction in number of nodes harvested. It can also be argued that same basin recurrence can be due to positive non sentinel nodes rather than missed true sentinel nodes.

We were also invited to clarify some points in our results section. We initially identified 45 patients, from whom a total of 113 nodes were harvested. Three of the 45 patients were then excluded (as shown in Figure 1) because the radioactivity counts of their sentinel nodes were not recorded in their operation note and it was therefore not possible to determine which were the "hotter" nodes in these basins. Therefore, 42 patients were included, from whom 107 nodes were sampled. With regards to not all of the hottest nodes being positive, in 19% of positive nodal basins the most radioactive node did not harbour micrometastases but a node that was less radioactive did. With regards to not all positive nodes being blue, only 84% of the nodes that contained micrometastases were stained with the blue dye.

Finally, we agree with the authors that harvesting three or more sentinel nodes can be considered a failure of the technique. Unfortunately, this is a fairly common occurrence when applying the "10% rule" and this was one of the motivating factors for conducting our study. Abandoning the routine use of blue dye is a safe option to reduce the number of nodes harvested, whilst maintaining the sensitivity of intra-operative sentinel node identification.

Funding

None.

Conflicts of interest

None.

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Reduction mammaplasty technique. The core and the master key of oncoplastic breast surgery

Dear Sir,

In 2011, I presented an idea for the debate without any success. It was published as a controversial question, incorporating the surgical treatment of symptomatic macromastia in a Breast Cancer Unit: could this be a useful management policy?.[1] Several years after seeing the development of oncoplastic surgery, I think it deserves to be presented again.

Nowadays, therapeutic mammaplasty or the use of a reduction mammoplasty technique (RM) to treat conservatively a breast cancer with oncoplastic surgery (tumor adaptive reduction mammaplasty) is considered a current standard procedure[2] and is clearly the most frequent.[3] This is because RM is a truly versatile technique that allows the surgeon to remove a tumor located in any quadrant of the breast with only one of the following two conditions: moderate or large breast size or enough breast inferior pole to remodel (ptosis). In addition, the technique is safe and effective oncologically, with an acceptable morbidity and a good cosmetic result and a high patient satisfaction score.[4]

In saying this, it is clear that RM is a useful and indispensable tool for a breast surgeon who wants to perform modern breast surgery. The surgeon who handles RM is able to face oncoplastic breast conservation surgery and symmetrization of the contralateral breast in the context of conservative treatment or in the process of postmastectomy breast reconstruction.

The most valuable property of RM is that it combines many surgical details or steps that are the surgical basis of the rest of most oncoplastic techniques. In my opinion, the way is easier when the surgeon tries to learn this first than if they hardly advance from the inferior level techniques stopping when they reach the RM and considering them as a limit or a border.

Another point, perhaps the most critical, is that there is a lack of training with evident barriers to access to learning. A survey conducted by the Oncoplastic Surgery Committee of the American Society of Breast Surgeons with 708 respondents (representing 26% of active practice membership) showed that a minority of respondents reported having breast reductions/mammoplasty performed independently (19%) or contralateral symmetry (10%) and interest in oncoplastic surgery among surgeons it is significant, but there are barriers to incorporating these surgical techniques in a breast surgeon practice.[5]

About symptomatic macromastia, the following statement is universal and real, surgeons have an effective and efficient treatment consisting of RM that is administered under strict, inadequate and inequitable criteria, as the term "postal code lottery" refers to.[6]

At that time, I proposed a naive idea as one of the possible solutions, why not incorporate the treatment of macromastia in breast units? This policy offers two advantages: increasing the insufficient supply for patients with large breasts suffering from symptomatic macromastia and enabling the training in reduction mammoplasty techniques for breast surgeons.

I said that it was naive because I know that breast cancer is a border issue between specialties and specialists, for example, in Europe, Gynaecology, General Surgery and Plastic Surgery share this field. I think we are all aware that nobody can now, nor in the future we will treat breast cancer exclusively, so cooperation should be the way to treat, teach and learn.

Our experience similar to that of others confirms that this management policy is very useful and viable.

Conflict of interest

None.

Funding

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Novel technique of filler injection in the temple area using the vein detection device

Dear Sir,

The increasing popularity of soft tissue fillers will inevitably result in increasing incidence of vascular injury. The temple area consists of several layers such as the superficial subcutaneous layer, superficial temporal fascia, loose areolar tissue, deep temporal fascia, temporalis muscle, and temporal bone from the zygomatic arch to the superior temporal septum. Fillers can be injected into various layers: first, the superficial subcutaneous layer; second, between the superficial temporal fascia and deep temporal fascia; and third, above the periosteum of the temporal bone.[1] The temple area has various anatomic layers and is known as a "danger zone" as regard filler injection because of many vascular structures.[2] The introduction of near-infrared detection to map superficial veins in the clinical setting potentially reduced the risk of vascular complications.

Patients who underwent HA filler injection in the temple area for purely aesthetic reasons between August of 2017 and December of 2017 at private clinic were identified by retrospectively reviewing their medical records. A single practitioner performed all of the procedure. Among the multiple layers of the temple area, we selected the superficial temporal subcutaneous layer. The most superficial layer that filler can be injected is between the dermis and superficial temporal fascia, and the only vascular structure is the sentinel vein and superficial temporal vein. An adverse vascular event was defined as any bleeding by venipuncture during the injection, intravascular injection and bruising, or hematoma after injection. Pre-procedural and immediate post-procedural photographs were analyzed with clinical photography.

Through wearing the glasses with an attached real-time vein-detecting viewer, the probe could find superficial veins. The probe is a portable, non-contrast hypodermic vein-detecting apparatus based on near-infrared optical system. Sentinel vein and superficial temporal vein has many variations between patients when observed carefully (Figure 1). Avoiding the vessel, we injected hyaluronic acid filler, e.p.t.q. S100 (JETEMA Co., LTD, Seoul, South Korea), perpendicular to the skin. e.p.t.q S100 is a monophasic, colorless, and transparent non-animal-derived stabilized hyaluronic acid filler and used for the dermal and subdermal layer as recommended by the manufacturer.

During the study period, a total of 20 patients (female, aged 31.3 (28–35) years) underwent the temple augmentation procedure and each patient received 0.3–1 cc of hyaluronic acid filler into the superficial subcutaneous layer at the temple area each side (total 0.6–2 cc). None of the patients have shown bleeding, hematoma, bruising, and vascular compromise (Figure 2). A superficial temporal vein was easily identified using a vein imaging device. The probe has a high image quality, could detect facial veins, and is so useful for avoiding vascular problems during filler injection.

The superficial subcutaneous layer has the danger of resulting to a vascular problem including destruction of the sentinel vein and superficial temporal vein. However, sentinel veins and superficial temporal vein, which are the

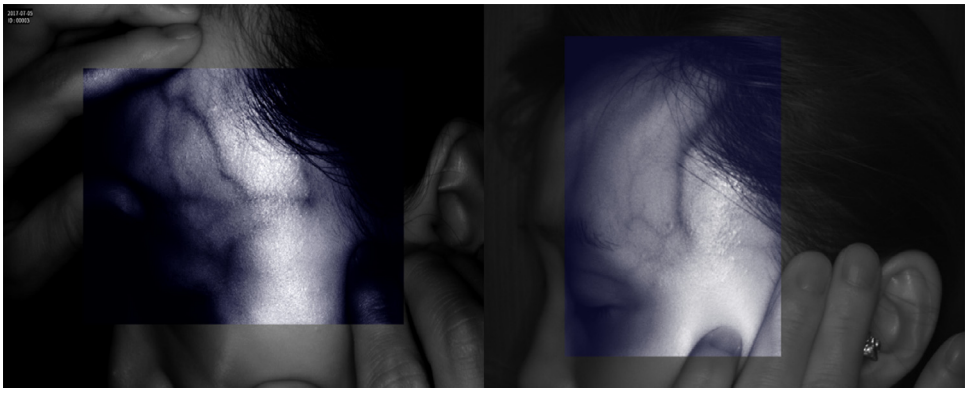

Figure 1 High resolution near infrared illumination of the superficial temporal vein. Anatomic variation between patients of the sentinel vein and superficial temporal vein is identified. Detecting the sentinel vein and superficial temporal vein through the real-time viewer attached to a glass and injection of filler, avoiding vascular problems.

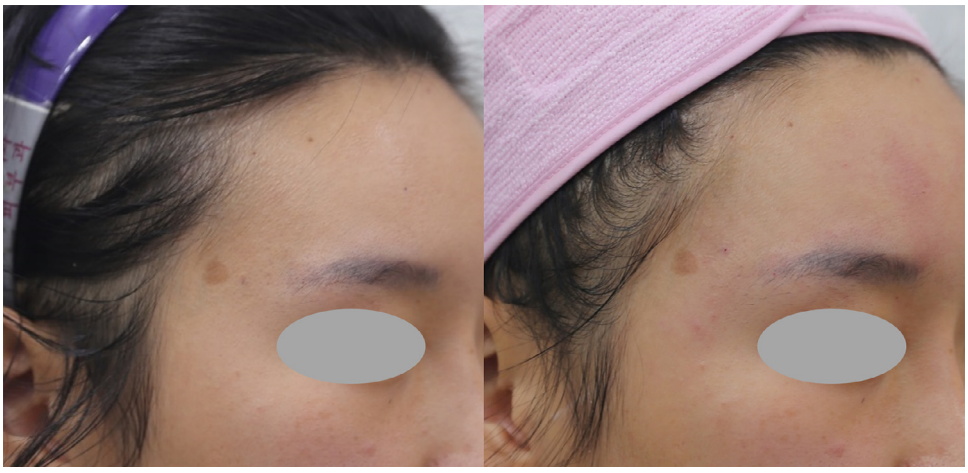

Figure 2 31 years old female patient treated with hyaluronic acid filler for temple volumization. Hyaluronic acid filler 1cc each to the temple. Pre-procedural photograph (Lt.). Immediate post-procedural photograph. There were no injection-related adverse events other than several injection spots (Rt.).

outmost vessels, using the near-infrared vein detector, are easily noticeable. Injection to the superficial subcutaneous layer, avoiding sentinel vein and superficial temporal vein, is considered one of the safest ways to avoid intravascular injection.

The probe is the latest product of near-infrared technology vein illuminator and has a limitation regarding the viewing of deep vein system, but almost every superficial vein is detectable. It is quite useful for not just filler injection but also botulinum toxin injection to prevent bruising after injection. To augment the temple area, it is a safe method to use the probe when injecting the soft tissue filler in the superficial subcutaneous layer.

Conflict of interest

None of the following authors have any proprietary interests or conflicts of interest related to this submission: none of authors.

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