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Correspondence and Communications

Re: Absorbable sutures for skin closure after carpal tunnel decompression: A Cochrane review summary

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Dear Sir,

I write regarding 'Absorbable sutures for skin closure after carpal tunnel decompression: A Cochrane review summary1'. In my opinion, the learned authors make a common mistake, in that they make conclusions which their data are unable to support.[1]

The authors meticulously collate and meta-analyse five randomised trials, interrogating whether the properties of the suture material used to close the skin following open carpal tunnel decompression affect outcome. They provide an excellent summary of the data, after performing an examination of the quality of the data they input into their study. They found that 'studies were at high risk of methodological bias and the certainty of the conclusions (GRADE) from the evidence was very low'. They go on to 'suggest that if surgeons use absorbable sutures to close the skin after CTD and arrange no face-to-face follow-up, then the NHS could save over £5 million annually'. I find this statement misleading based on the data they present, and respectfully ask that this common methodological flaw is noted. Due to the poor quality of the studies, their data only support their final conclusion, that further work is required.

Conflict of interest

None.

Funding

None.

Reference

1. Wade RG, Wormald JCR, Figus A. Absorbable sutures for skin closure after carpal tunnel decompression: a Cochrane review summary. *J Plast Reconstr Aesthetic Surg* 2018;**71**(12):1816–34.

Response to letter comments on "Absorbable sutures for carpal tunnel decompression: A Cochrane review summary"

Dear Sir,

Thank you for sharing Mr. Gokani's letter[1] regarding the summary[2] of our Cochrane review[3]. It seems that our analysis of the available data and subsequent speculations of potential fiscal savings have been misconstrued as recommendations for practice. Foremost, we feel it is necessary to reiterate our conclusion[3] that "*It is uncertain whether absorbable sutures confer better, worse or equivalent outcomes compared to non-absorbable sutures following carpal tunnel decompression, because the quality of evidence is very low*" which was summarised into "*our Cochrane review recommends further non-inferiority randomised trials*". Those interested in the summary co-published in JPRAS[2] should read our original Cochrane review[3].

To frame the potential translational value of the universal use of absorbable sutures, we conjecture that substantial fiscal savings could be made. This supposition was based on publicly available resources. The Personal Social Services

Research Unit (PSSRU) publishes annual reports of the NHS Unit Costs of Health and Social Care[4] and their data shows that an outpatient or community nurse appointment (e.g., to remove sutures following carpal tunnel decompression) costs £68–128. The annual frequency of carpal tunnel decompressions in England is detailed in the NHS Digital Hospital Episode Static database (www.hesonline.nhs.uk), which Bebbington and Furniss[5] used to calculate future (expected) rates of carpal tunnel decompressions. At the time of publication (2018), we multiplied the expected number of carpal tunnel decompressions in England (73,237)[5] by the minimum cost to remove sutures in the community (£68), although it's probable that many are removed in hospital greater cost. So, if all surgeons arranged a postoperative wound check +/− suture removal, then the NHS might spend at least £4,980,116 (which we rounded to £5million) annually on nurse appointments. However, £5million is probably an underestimation for several reasons. This figure does not consider the 13,321 individuals in Scotland, Wales and Northern Ireland[6] who probably underwent carpal tunnel decompression in 2018. Further, the quoted PSSRU costs[4] do not account for associated expenses, such as gloves, gowns, dressing packs, suture removal blades or scissors, additional dressings, sharps and clinical waste disposal, etc. or indirect costs to society, such as patient travel, time off work, etc. which might be needed to remove non-absorbable sutures. Therefore, despite Mr. Gokani's misinterpretation of our 'hypothesis-for-testing' as a recommendation for practice, we are grateful for the opportunity to explain why savings might be possible and the importance in high-quality research in answering such questions.

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Conflicts of interest

There are no conflicts of interest.

Ethical review

N/A.

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The distally based posterior interosseous artery flap should be called the 5, 6 distal inter-compartmental septal artery flap

Dear Sir,

Re: Techniques to enable identification and safe elevation of the posterior interosseous artery flap. Nikkah D, Pickford M. JPRAS 2018 1821-22.

This helpful advice from the authors will enable the reliable, reproducible elevation of the distally based posterior interosseous artery flap (PIA).

However we believe the "complexity in elevation"[1] is in part due to the mis-labelling of this flap. The perforators on which the commonly called PIA flap depend do not arise from the main trunk of PIA but from an unnamed branch of the PIA that travels along the 5,6 extensor inter-compartmental septum which we call the 5,6 dorsal intercompartmental septal artery (5,6 DICSA).

It is often mis-reported for example that, "The PIA flap is based on reverse flow through the PIA via anastomosis with the anterior interosseous artery (AIA) and the dorsal carpal arches near the wrist joint"[2], or "the posterior interosseous vascular pedicle then runs in the intermuscular septum between the ECU and the EDM"[2], and "the PIA arises from the common interosseous artery, (entering) the posterior compartment of the forearm at the junction of the proximal and middle thirds, and then runs distally in the intermuscular septum between the extensor carpi ulnaris and the extensor digiti minimi proprius, giving off perforators all along its length"[3] (Figure 1).

However, these descriptions are not of the path of the main trunk of the PIA but of an unnamed branch of the PIA, which could be named the 5,6 DICSA. The true PIA according to anatomical texts; " passes distally in the posterior compartment of the forearm between the superficial and deep layers of the extensor muscles and branches to both groups of muscles. The PIA continues along the dorsal surface of the abductor pollicis longus and extensor pollicis brevis and is accompanied by the posterior interosseous nerve"[4]. "The PIA itself descends on the posterior surface of the interosseous membrane alongside the posterior interosseous nerve (from the radial nerve) between the supinator (superficially) and abductor pollicis longus (deeply) muscles, supplying both. In the distal forearm it terminates by anastomosing with a branch of the AIA having just pierced the interosseous membrane and together they contribute to the dorsal carpal arch"[5].

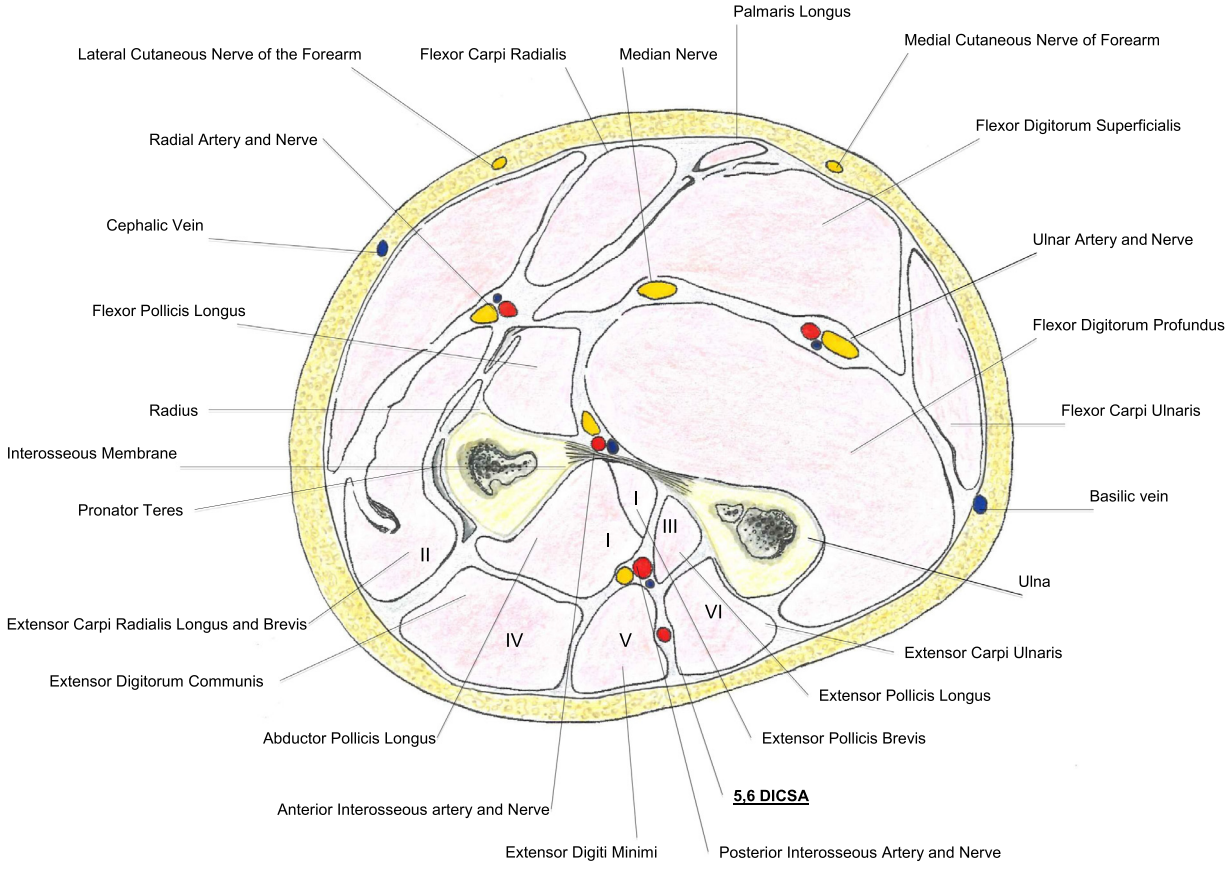
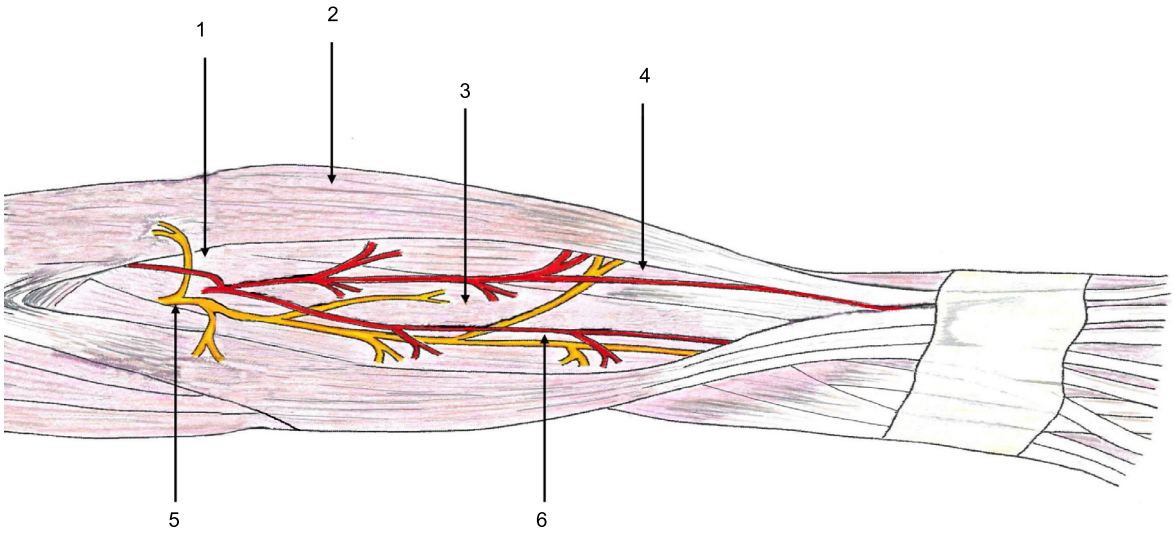


Figure 1 Transverse Section of Right Forearm displaying the true PIA and the 5,6 DICSA.



1) Posterior Interosseous Artery Emerging
2) Extensor Carpi Ulnaris
3) Origin of Extensor Digiti Minimi, Extensor Pollicis Longus and Extensor Indicis- muscles removed
4) **5,6 DICSA**
5) Posterior Interosseous Nerve
6) Posterior Interosseous Artery and Nerve in the floor of the fourth compartment between EDM, EPL, EI and APB, EPB

Figure 2 The left extensor forearm schematically displaying the true PIA and the 5,6DICSA.

Forearmed with such knowledge of the PIA, a surgeon whom has not seen a distally based PIA flap or been trained in its raising may attempt to construct it erroneously on the main trunk of the PIA running adjacent to the posterior interosseous nerve in the floor of the fourth extensor compartment. This vessel does indeed have sparse perforators to skin, but these are unreliable in comparison to those that arise from the 5,6 DICSA, which constantly passes on the radial aspect of the septum deep to the deep extensor fascia of the forearm. (Figure 2).

Our clinical and cadaveric dissections show that proximally the 5,6 DICSA arises from the PIA after it passes above the interrosseous membrane oblique cord and gives origin to the recurrent interosseous branch (which anastomoses with the terminal branches of the profunda brachii), the true posterior interosseous artery and some muscular branches. The 5,6 DICSA then passes ulnarwards under the EDM to lie adjacent to the radial aspect of the septum between ECU and EDM. Initially it lies deep at the base of the septum but as it travels distally, it passes obliquely such that in the distal third of the forearm it lies more superficially, on the deep surface of the deep fascia.

Distally, the 5,6 DICSA and accompanying venae comitantes anastamose with the dorsal carpal arch. This is partly formed by the termination of the true PIA and augmented by the dorsal branch of the AIA and recurrent branches from the intermetacarpal vessels, most commonly from the third and fourth interspaces, and often at the level of the distal radioulnar joint (DRUJ) with a transverse vessel that in turn connects to the PIA and AIA within the base of the fourth extensor compartment.

As the 5,6 DICSA passes between the ECU and EDM the septum is easily palpated and thus marked indicating the true axis of the flap, rather than using more arbitrary bony land marks. We find the reported lateral epicondyle to DRUJ axis lies more radial than the 5,6 extensor inter-compartmental septum and if the septum itself is not palpable, will use an axis connecting the mid-point between the lateral epicondyle and the olecranon to the DRUJ.

In order to enhance safe flap elevation, when designing and elevating a flap said to be based on the PIA one needs to counteract the conflict of knowing the textbook anatomy of the PIA with the reality that the so called PIA flap is in fact derived from a separate branch running along the 5,6 inter-compartmental septum. One method of preventing such conflict, and enhancing flap elevation would be to re-name the PIA flap the 5,6 dorsal intercompartmental septal artery flap (5,6 DICSA flap), after the true vessel on which the flap is raised.

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Techniques to enable identification and safe elevation of the posterior interosseous artery flap: Part 2

Dear Sir,

Giele and colleagues make an interesting point regarding the terminology of the PIA flap. We personally do not know any hand surgeons that would erroneously raise this flap in the 4th extensor compartment. Whether it should be called the 5,6 DICSA or PIA flap, most surgeons identify the pedicle to this flap between the ECU and EDM. They are claiming that all other descriptions are all incorrect based on their unpublished 'data'. I would politely suggest they publish their anatomical findings to peer review and publication as they do not offer any clinical or cadaveric images.

The point we were making is to simplify the process of flap elevation. This is the key in many operations, demystifying a flap that many surgeons avoid[1,2]. The perforators between ECU and EDM compartments lead to the pedicle of the PIA flap Figure 1. This we illustrate in a short video sequence (Video 1), where I am moving the EDM and one can see the septum under the translucent fascia between ECU and EDM. A number of perforators are seen here coming off the septum, this helps the surgeon track down the correct axis of the flap, and where one should design the skin paddle.

It appears they have missed the point of our correspondence and clear figures and look on it as anatomists not surgeons. Textbook knowledge is great, but following these simple steps as illustrated in Figure 1 prevents inadvertent injury to the pedicle, its safe identification, and a skin paddle that is supplied by appropriate perforators from the pedicle.

Conflicts of interest

None declared.

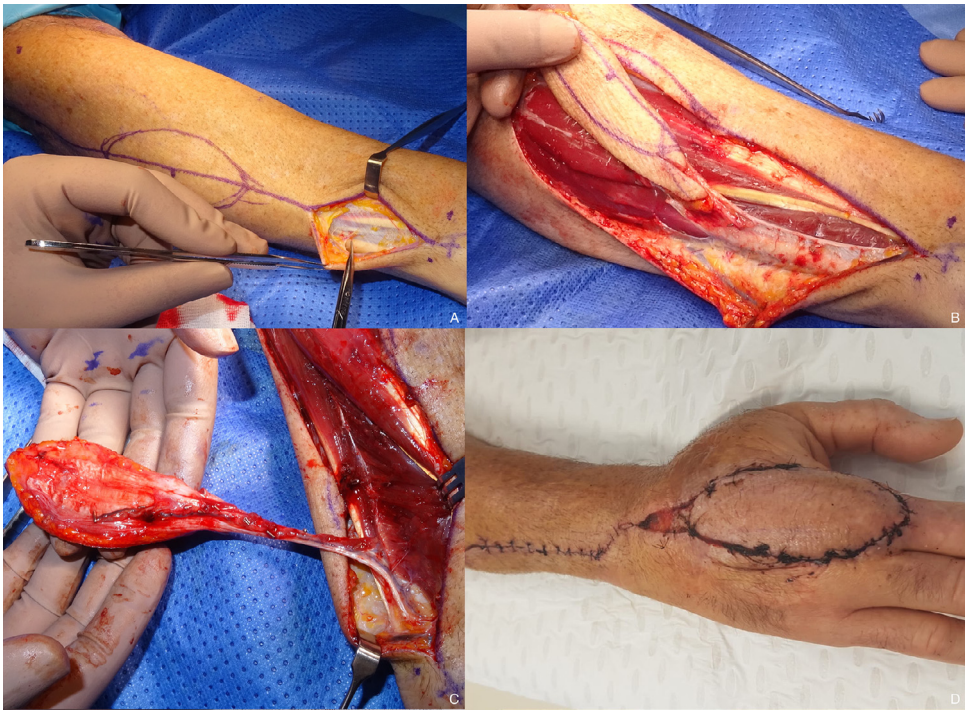

Figure 1 (A). Demonstrating perforator emerging from ECU – EDM compartment, this leads down to the main pedicle to the PIA flap (B). Once identified the fascia is preserved over the pedicle and protects it (C) careful dissection distally to island the flap (D) Early result at 2 weeks.

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Ethical approval

Not required.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.bjps.2019.02.006.

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Abdominoplasty in massive weight loss patient: Modifying the technique to improve the safety

Dear Sir,

We read with great interest the recent article by Pajula et al.[1] regarding complications after lower body contouring in massive weight loss patients. This retrospective review analyzed 158 patients undergoing abdominoplasty or belt lipectomy after massive weight loss. Patients were divided into two groups using the weight loss method employed: those who lost weight through bariatric surgery (90 patients, 57%) and those who lost weight through diet or physical activity (68 patients, 43%). The most common bariatric procedure was gastric bypass (75 patients, 83.3%) followed by sleeve gastrectomy (14 patients, 15.5%), and gastric balloon (1 patient, 1.1%). 112 patients (70.9%), underwent abdominoplasty and 46 (29.1%) belt lipectomy. The authors identified a total of 96 complications in 80 patients, with an overall rate of 51%. 80% of patients presented only one complication and 20% presented two. According to the Clavien-Dindo classification, 47.9% of patients presented a grade 1 complication, 32.3% grade 2, 5.2% grade 3a and 14.6% grade 3b. The most common complication was infection (33%) followed by seroma (24%) and hematoma/bleeding (23%). The authors found no statistical difference in terms of the complications when comparing the bariatric and non-bariatric groups. On the contrary, a significant association was found between older age at operation, high maximum weight and a high preoperative weight and immediate hematoma or bleeding needing surgical intervention and late seroma. We commend the authors for this interesting study and we have some thoughts that we would like to share. Since the aim of this study is to further clarify risk factors and incidence of complications related to lower body contouring after massive weight loss, we would like to focus our attention on two points. The first point is that the authors reported that 70.9% of patients analyzed in this study has undergone abdominoplasty but there is no mention about the technique employed. In massive weight loss patients, particularly after bariatric surgery, the incidence of complications related to abdominoplasty is heavily dependent on the extent of undermining of the upper abdominal flap and on the preservation of Scarpa fascia.[2] This is particularly true if, among the possible complications, we consider infection, seroma and hematoma, i.e. those reported by the authors. In fact, the present state of the art of abdominoplasty after massive weight loss improved the standard technique by limiting the upper flap undermining to a central tunnel, of variable width that allows plication, associated to quilting sutures during closure. These two technical details reduce the dead space, decreasing the risk of hematoma and seroma and preserve the perforators from abdominal muscles avoiding devascularization of the upper flap and thus reducing the risk of wound dehiscence and infection. Moreover, Scarpa fascia preservation allows to reduce the incidence of seroma and hematoma with a mechanism that still has to be completely clarified (Figure 1). Limited upper flap undermining and Scarpa fascia preservation are feasible even in the case of anchor abdominoplasty[3] (Figure 2), that can be appropriate in massive weight loss patients to provide optimal aesthetic and functional result.

The second point that in our opinion is worthy to be considered is that the authors didn't find significant difference in terms of complications between the group of patients that had lost weight after bariatric surgery and the group of non-bariatric patients which lost weight through changes in dietary habits or physical activity.

Although the authors acknowledge the limited number of patients included in the study, this figure must not be overlooked because it is contrary to the entire current scientific literature. Probably one of the causes that explains this data reported by the authors is that among the bariatric group no patient had undergone Biliopancreatic diversion (BPD). In our wide experience with body contouring for

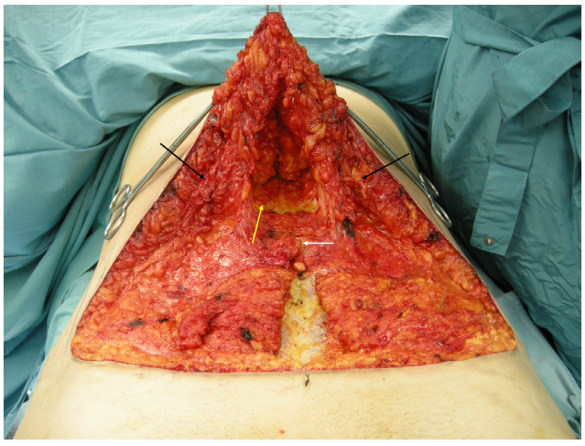

Figure 1 Intraoperative view of abdominoplasty in a 38 years old male patient, who changed his Body Mass Index (BMI) from 43 to 26.7 after gastric bypass. The Scarpa fascia was preserved between the navel (white arrow) and the pubis. Only a central tunnel (yellow arrow) was created under the upper flap, to allow downward mobilization of the flap and midline plication. The remaining part of the upper flap was not undermined (black arrows) preserving vascularization by perforators sparing and reducing the dead space.

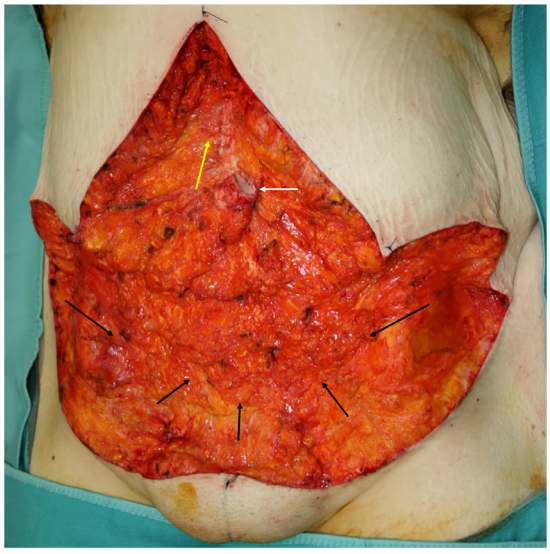

Figure 2 Intraoperative view of abdominoplasty with inverted Y incision, performed in a 30 years old female patient, who changed her BMI from 54 to 25 after gastric bypass. The Scarpa fascia (black arrows) was preserved between the navel (white arrow) and the pubis. The undermining was limited to the central tunnel indicated by yellow arrow.

massive weight loss after bariatric surgery, we documented that the different bariatric procedures cause modifications in skin and subcutaneous tissue and wound healing impairment to varying degrees, with the worst impact typically associated to BPD. The reason for such considerable differences is based on the role of malnutrition that follows BPD procedure.[4]

We therefore believe that having included in this study only patients undergone to gastric bypass, sleeve gastrectomy, and gastric balloon, that are known to be procedures with minor impact on complications and wound healing, could explain this discrepancy between authors' findings and current literature.

We completely agree with the authors that every patient undergoing body contouring after massive weight loss should be considered individually for surgical planning and risk factors.[5] Anyway, even if in these patients there is no compromise between any abdominoplasty procedure and the potential onset of complications preference should be given to safer techniques.

Conflict of interest

Authors have no conflict of interest to disclose.

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Response to the comment on "Abdominoplasty in massive weight loss patient: Modifying the technique to improve the safety"

Dear Sir,

We thank Dr. Gentileschi and colleagues for commenting our article; complications after lower body contouring surgery due to massive weight loss unaffected by weight loss method[1] and interest in our work.

We agree with Dr. Gentileschi et al.[2] that especially in massive weight loss (MWL) patients the number of complications is related to body contouring technique used. Our study presented single centre experience on MWL lower body contouring surgery. In our centre, we have used technique with limited upper flap – above umbilicus – lateral undermining to tunnel in the apex and raising the flap on the muscle fascia plane. Below the umbilicus, Scarpaś fascia is usually preserved in some 5–10 cm above the incision. As Gentilechi et al. point out, it is unclear why the preservation of Scarpaś fascia seem to reduce the number of certain complications or does preserving technique not provide any additional benefit, as our study showed.[1]

Regarding biliopancreatic diversion, we confirm that none of the patients in our series had this operation. We included all MWL patients operated in our department during the time frame described in our article with no exclusion based on bariatric surgery technique. To best of our knowledge, the biliopancreatic diversion operation is usually reserved for second line operation for morbid obesity in Finland. Finnish national study during 2009–2013 among 3918 patients who undergone surgery for morbid obesity, only 2.6% had biliopancreatic diversion with or without duodenal switch.[3] Therefore, we have no expertise on commenting whether the good results in our study were due to absence of biliopancreatic diversion and rely on the data presented by Tambasco et al.[4]

When designing and drafting our article we obviously oriented to most of the previous articles. We found, that systematic grading of post-operative complications was seldom used. Based on our experience, we suggest that grading systems such as Clavien–Dindo, should be used in future studies. Systemic grading makes the comparison of results objective and ensues fruitful academic discussion.

Conflict of interest

None declared.

Funding

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Comment on: "Efficacy of autologous fat transfer for the correction of contour deformities in the breast: A systematic review and meta-analysis"

Dear Sir,

We read with interest the article entitled 'Efficacy of autologous fat transfer for the correction of contour deformities in the breast: A systematic review and meta-analysis,'[1] which evaluates and synthesizes the evidence examining the overall efficacy of autologous fat grafting (AFT) for the correction of contour deformities of the breast. We would like to congratulate Krastev and coworkers for their paper and kindly thank them for citing our studies.

AFT, in addition, takes on a main role in the correction of the contour of the stenotic breast. We recently performed a retrospective analysis on 1600 consecutive female patients admitted to our plastic surgery department from January 2009 to July 2014 with the aim of demonstrating TBD high prevalence since it has not been properly investigated. We saw that stenotic breast deformity (TBD) is a condition particularly prevalent in the general population, especially in women seeking breast augmentation or breast reduction (about 50%).[2]

In our paper 'Stenotic Malformation and its Reconstructive Surgical Correction: A New Concept from Minor Deformity to Tuberous Breast'[3] we proposed a new TBD classification based on stenosis type, glandular trophism, and ptosis and we showed how both scar tissue and stenotic fibrotic tissue improved tissue release and lower pole filling upon needle-based autologous fat grafting. In particular, deformities due to persistence of the previous inframammary fold shape can be corrected by fat needle injection.[4] AFT can be used in the upper pole to improve the breast profile as well. This last part is best described in our study 'Fat Graft in Composite Breast Augmentation with Round Implants: A New Concept for Breast Reshaping,'[5] in which we employed fat grafting in 31 female patients who underwent primary aesthetic breast augmentation with round implants and fat grafting for hypomastia from January 2016 to June 2017. We considered the following parameters: shape, symmetry (volume symmetry and NAC symmetry in terms of diameter and position), presence/absence of rippling, implant visibility and/or palpability, capsular contracture, and upper pole contour. We followed the patients up for 3 to 12 months and we achieved in all cases high patient satisfaction and good aesthetic outcomes with a 'natural' breast shape and a 'smoothened' upper pole with low complication rates. The aesthetic outcome was stable over time. Therefore, being the technique safe, simple, and fast, we advocate the use of fat grafting every time there is an indication to place a round implant.

To conclude, we firmly believe that in a modern approach to breast augmentation, fat grafting is becoming an essential procedure for breast reshaping even when associated with round implants.

Conflict of interest

None.

Funding

None.

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Reply: Comment on 'Efficacy of autologous fat transfer for the correction of contour deformities in the breast: A systematic review and meta-analysis'

Dear Sir,

With great interest we have read the comments and references of Vinci and colleagues regarding our recently published meta-analysis.[1] We would like to thank the authors for their appreciation of our paper as well as for sharing their valuable experience with autologous fat transfer (AFT) in the breast. As was demonstrated in our extensive meta-analysis, AFT does indeed prove to be an effective tool in correcting a wide array of contour deformities of the breast. With the majority of studies focusing on investigating the efficacy of AFT in the treatment of sequelae of breast cancer, its role in congenital breast malformations has been studied less frequently. The latter consisted primarily of patients with breast hypoplasia, Poland syndrome, tuberous breasts or mild forms of pectus excavatum.

As Vinci et al. have correctly pointed out, the tuberous breast deformity or rather the proposed term "stenotic breast" is a relevant example where patients can benefit from both the volume restorative aspect of AFT as well as the breakdown of fibrous tissue and release of adhesions. The latter has been a subject of great interest in recent years with the accumulating evidence on the use of AFT in the treatment of scars, burns or radiotherapy tissue damage.[2] Furthermore, as the authors have already mentioned, strategic fat injection in key areas of the breast such as the upper pole can help produce a more natural result than with breast implants alone as well as increase the autologous tissue-to-implant ratio in these patients. Although AFT is often employed as a secondary procedure (e.g., after implant-based reconstruction), a number of authors have also reported encouraging results using AFT alone. A breast reconstruction with exclusively AFT, thereby avoiding the use of implants or flaps, can offer unique advantages particularly in these younger congenital patients, due to its autologous nature and virtual absence of scarring.[3] However, unlike the correction of contour deformities, the efficacy of large-volume AFT has not yet been established. This is mainly due to recognised limitations in the volume that can be safely grafted per procedure that would inevitably translate in a too high number of reoperations.

For this reason, we are currently evaluating the use AFT in combination with external pre-expansion for total breast reconstruction following mastectomy in a large multicentre RCT in the Netherlands (*B*reast *R*econstruction with *E*xternal pre-expansion and *A*utologous fat transfer vs. *S*tandard *T*herapy trial - the *BREAST* trial, NCT02339779).[4] With this study, which is expected to be completed by 2022, we hope to be able to provide reliable evidence (including 3-Dimensional volume measurements) on whether AFT with external expansion is as effective and safe compared to the control group – implants. Should that be the case, AFT could offer patients with mastectomy or breast hypoplasia (e.g., Poland syndrome) with an attractive alternative to conventional prosthetic or flap-based reconstruction modalities in the near future.

Conflict of interests

The authors declare no conflict of interests.

Funding

None.

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Porcine model for training in oncoplastic breast surgery technical description and results of its application in a training course in oncoplastic and reconstructive techniques in breast surgery

Dear Sir,

Breast surgeons need specific training in oncoplastic and reconstructive procedures for planning a surgery specific to the breast and the tumor.[1] The porcine model provides an option for this training need thanks to its anatomical similarity to humans, manageability of young specimens and relative low cost.[2,3] The objective of this report is to describe a porcine model for performing latissimus dorsi muscle flaps (LDMF) and transverse rectus abdominis muscle (TRAM) flaps, as well as their evaluation by some of the students to learn about their strengths and weaknesses.

This oncoplastic and reconstructive breast surgery course was planned through a continuing training program of the Ministry of Health in Spain; accredited 69 classroom hours with 14.6 credits, equivalent to 104.2 CME credits. Animal Procedures were conducted in accordance with Spanish regulations on the use of animals for scientific purposes and the guidelines of the European Community Directive 2010/63/EU. The course was approved by the regional ethics committee under code 15002/2016/14. The practical workshop consisted of the execution of an LDMF and TRAM flaps by each student and was carried out at two training centers. In A Coruña, Spain, the course is carried out annually since 2006 at "Centro Tecnológico de Formación". In Mexico City, Mexico, the course was held 2 years at "Centro de Adiestramiento Quirúrgico" (CENADIQ).[4] Large white female pigs with a weight between 30 and 35 kg were used. The course teachers supervised the surgical interventions carried out by each student and evaluated the final result, especially the vascular viability of the flap at the end of the surgical intervention. Finally, the students responded to a questionnaire in which each technical procedure was evaluated individually to learn about their strengths and weaknesses.

Latissimus dorsi muscle flap

The layout of the LDMF in pigs is similar to humans in terms of its location and anatomical features. The muscle body is located at an intermediate point between the olecranon and the scapula, and thus the cutaneous island was designed in said location (Figure 1). As in the human model, dissection in the medial direction allowed the identification of the trapezius muscle and finally the separation of the flap from the thoracic wall. During this maneuver, several intercostal perforators were visualized, dissected and ligated. The flap was then released cephalad to the pedicle allowing the identification of the serratus major muscle. In the tendinous portion, the thoracodorsal vessels were dissected and the tendon was sectioned for better release of the LDMF.

TRAM flap

Unlike the human, the porcine model has a greater oblique muscle that completely covers the abdominal cavity, from the paravertebral muscles to the midline, with the exception of the hypogastrium, where the abdominal wall is constituted exclusively by the anterior rectus muscle in its middle third. The TRAM flap in the pig begins by designing two cutaneous islands in the hypogastric region for better educational use of the animal. Once the skin was incised, the island remained attached to the aponeurosis and dissection was started cephalad, between the aponeurosis surface of the anterior rectus and the body of the anterior rectus to facilitate its mobilization with the cutaneous island. Once the muscle body was released, it was sectioned under the

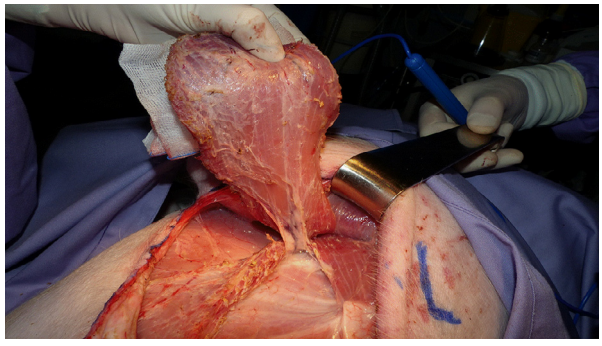

Figure 1 Dissection of the LDMF in the porcine model.

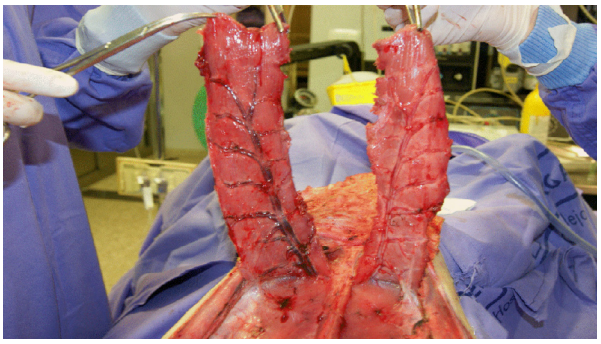

Figure 2 Dissection of the TRAM flap in the porcine model.

cutaneous island and the ligature of the epigastric vessels (Figure 2).

During the years 2015–2018, a total of 6 training courses were organized with the use of the porcine model, four of which were held in Spain and two in Mexico. A total of 251 students participated in these courses with an average age of 42.3 years. The average time for performing the latissimus dorsi muscle flap was slightly longer (38.3 minutes) than the TRAM flap (32.6 minutes). In assessing the model for the LDMF, the students highlighted its similarities to the human: the mobilization of the muscle from the thorax, the section of the lumbar perforators and the identification of the thoracodorsal pedicle. On the contrary, they highlighted greater difficulty in the porcine model in regard to the identification of the anatomical boundaries of the muscle as well as the paleness of the muscle fibers that limited their dissection. The students highlighted the similarity of the TRAM flap to the human model in terms of the dissection and release of the rectus abdominis muscle as well as its mobilization to the recipient area. On the contrary, they highlighted greater precariousness of the porcine model in regard to adherence of the cutaneous island to the aponeurosis, and greater fragility of the peritoneum in the posterior sheath of the muscle. The majority of the students (246) considered the TRAM technique more accessible in this model with respect to the dorsal muscle flap. The total cost of the six practical workshops amounted to 61,797 euros, which is an average of 244 euros per student (297 euros/student in the Spanish edition, 115 euros/student in the Mexican edition).

This experience allows us to conclude that the porcine model is suitable for surgical training in LDMF and TRAM flaps thanks to its anatomical similarity to humans. The model allows most of the technical steps to be recreated in both flaps, which allows for training prior to its execution in humans. Finally, the use of an animal by two surgeons and the joint execution of flaps and local procedures, especially those related to the NAC, provides a model with a good cost/benefit ratio for surgical training.

Funding

None.

Conflicts of interest

None declared.

Ethical approval

The course was approved by the regional animal experimentation ethics committee under code 15002/2016/14; P061.3

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Can facial proportions provide an objective assessment of prominent Ears? A survey of healthcare professionals☆

Dear Sir,

Evaluation of facial aesthetics is inherently subjective, though for centuries we have tried to objectify these assessments by using measures such as the 'Golden Ratio'.

☆ **Details of any meeting at which the work was presented, wholly or in part.** Oral Presentation: Scottish Otological Society Winter meeting 10/11/17

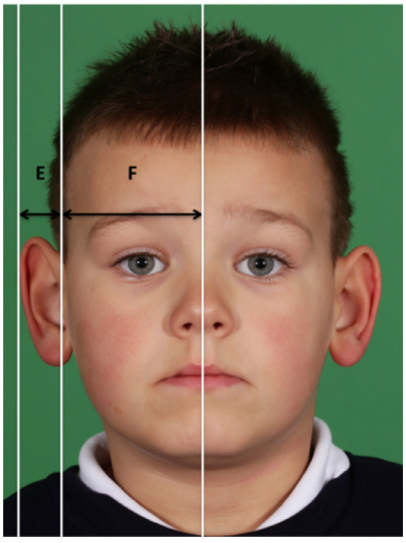

Figure 1 Ear Prominence is defined as E/F, where E is the distance from the lateral aspect of the pinna to lateral aspect of face and F is the distance from the lateral aspect of the face to the mid-point of the face (at the same vertical level as the upper border of the pinna). It should be noted that it is the ratio of these measurements which gives important objective information on the prominence of a subject's ears- therefore neither the scale used for measurement, nor the photography conditions (e.g. how far away the patient was from the camera) have an effect, as these conditions are maintained in the measurements being compared.

This study aims to make similar descriptions of prominent ears using a simple ratio observed in standard anterior preoperative clinical photographs.[1]

In order to assess the prominence of a subject's ears on the anterior clinical photograph, we recommend the measurement of two facial proportions in a simple ratio. These two measurements are; E, which is the distance from the most lateral aspect of the pinna to the lateral aspect of the face, and F, which is the distance from the lateral aspect of the face to the mid-point of the face (at the level of the upper border of the pinna). The ratio is then calculated as E/F (See Figure 1).

Pre-operative photographs of 8 children in the initial audit group (4 male, 4 female) undergoing pinnaplasty were digitally modified to produce 6 variations of ear size in standard facial proportion ratios from 0.2–0.45, increasing in steps of 0.5 (Figure 2).

This amounted to a total of 48 images, which were randomised and placed in a presentation for assessors to review. Assessors were asked to view each image independently and comment on whether the patient had prominent ears or not from their subjective assessment.

A group of 112 2nd year medical students from the University of Dundee Medical School viewed the images and commented on whether they considered each to represent ear prominence or not. Following this; a further 67 medical professionals were surveyed, including ENT consultants (12), ENT trainees (11), Plastic surgery consultants (6) and trainees (12), junior doctors (14) and 12 more senior medical students who were in either 4th or 5th year, on clinical placement in these departments.

Considering the results from the group as a whole there was a clear positive correlation between increasing facial proportion ratio and the subjective assessment of ear prominence. Images with a ratio of >0.3 were considered prominent by a mean of 154 respondents (86%), compared to a mean of 6 respondents (10%) who considered ears <0.3 prominent.

From our data there was a sharp demarcation between the facial proportion ratios considered to represent non-prominent versus prominent ears, and an overall agreement in those ears considered to be prominent regardless of clinical expertise. The facial proportion ratio of 0.3 appeared to mark this change in perception, as the majority of images showing a ratio of 0.3 or above were considered to show prominent ears. 38 (21%) of the total participants reported a ratio <0.3 was prominent compared with 141 (78%) of those who felt 0.3 or above was prominent and this was maintained through subsequent increased in respondents for larger ratios.

Assessing the results according to speciality and grade shows that Plastic Surgery consultants were the group who considered more of the 48 images demonstrative of prominent ears (mean 35/48 images considered to show prominence) compared to ENT consultants (29/48 images). These comparative results between specialties were mirrored in the responses of the trainees; where Plastic surgery trainees

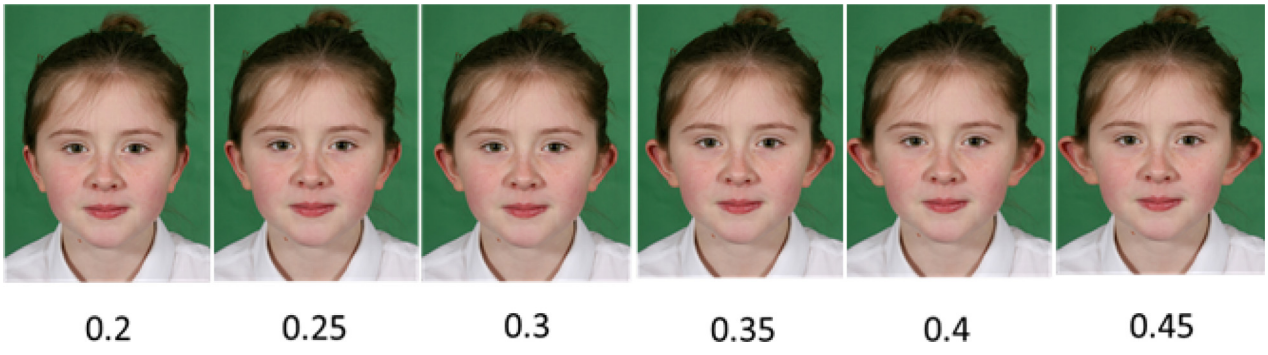

Figure 2 Example of one patient with images altered to demonstrate variation in E/F ratio.

again considered more images to show prominent ears (29/48 images) than ENT trainees (28/48 images). This is in contrast to junior doctors and medical students who felt 26 and 25 of the 48 images showed prominent ears, respectively. Therefore there is a trend for senior clinicians to assess more ears as prominent than their junior colleagues.

A simple, objective measurement of ear prominence using facial proportions could be invaluable when assessing patients regarding management of prominent ears. This can also help in the post-pinnaplasty assessment to ascertain the improvements made in ear prominence.

It must be remembered that this ratio calculates ear prominence on the anterior clinical photograph alone and does not factor in other abnormalities of the pinna which may require correction.[2] The subjective experience and potential negative emotions which patients and their families have due to prominent ears must not be underestimated. Young people in particular are vulnerable to long term mental health consequences if subjected to bullying due to their appearance.[3] The ratio we devised is not necessarily designed to be an arbitrary cut off for decision to go ahead with surgery but a tool which can aid in decision making for both the clinician and the patient.

The assessment of prominent ears and consideration of pinnaplasty is a complex medical and social issue. This study demonstrates that a facial proportion ratio of >0.3 on anterior clinical photographs is considered by a wide range of assessors to represent ear prominence.

This survey of 179 participants indicates that there is a relationship between level of clinical experience and the assessment of prominent ears; where more experienced clinicians are more likely to advocate operative management compared with junior doctors and medical students.

Conflict of interest statement

None declared.

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Ethical approval

As per local protocol approval and consent was sought from patients to have images and case details used for purposes of teaching and publication.

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Fragmented Fat: A new method for harvesting and processing of lipograft

Dear Sir,

Fat transfer has been recognized as an attractive tool for gluteal and breast augmentation, but harvesting limitations still represent a drawback, especially for post bariatric patients, as massive adipose deflation makes traditional liposuction less effective. On the other hand, circumferential apronectomies usually discard considerable amounts of viable fat tissue[1].

In order to optimize obtaining autologous injectable lipograft from dermolipectomy specimens, we propose a new method for harvesting and processing adipose tissue through a specific fragmentation device - grinder (Figure 1B), which might convert just about the entire subcutaneous layer into injectable lipograft.

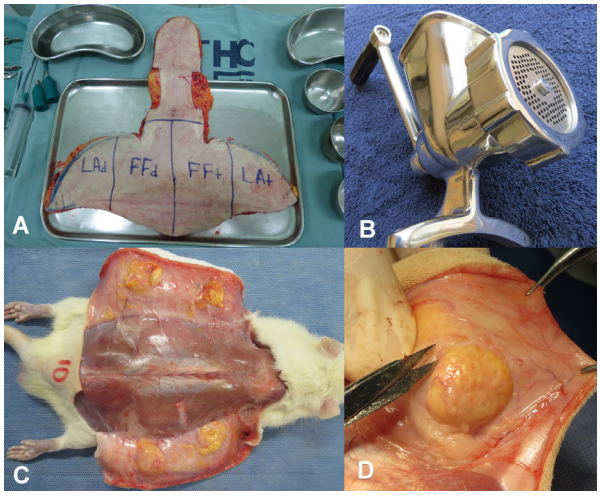

Figure 1 **A:** Fleur de Lis surgical specimen division to receive Dry and Tumescent Liposuction/Fragmentation (LAd; FFd; LAt; FFt); **B:** Fragmentation device; **C:** Wistar rat dorsal xenografts removal; **D:** Retained graft in detail.

Four different fat samples were harvested from the abdominal tissue of a massive weight loss female patient who underwent a fleur-de-lis abdominoplasty (Figure 1A). After resection and division of the specimen, Dry and Tumescent Liposuction as well as Fat Fragmentation (Video 1) were performed in order to compare graft retaining characteristics under different techniques. Each final source of adipose graft was equally treated by centrifugation (1200 rpm for 3 min) and then labeled as different "colors" to ensure blind manipulation. Samples were distributed into 1 ml syringes and immediately taken to the experimental laboratory, where they were selectively grafted into the dorsum of 10 Wistar rats. A 2 mm blunt cannula was used to subcutaneously retro-inject 1cc of each fat sample (FFd, LAd, FFt and LAt), separately to the different dorsal quadrants of all animals, in a clock wise rotating protocol. The rats were marked and kept receiving daily subcutaneous injections of cyclosporine (2 mg/kg). After 6 weeks, all animals were euthanized and the retained dorsal grafts were surgically removed (Figure 1C and D) for a comparative evaluation of mass (Chyo JS-110 electronic balance) and volume (Archimedes' principle observation), as well as histological characteristics under H&E and Masson's Trichrome staining. Fields were randomly chosen for a microscopy blind review, grading the presence of intact and nucleated adipose cells, cysts and vacuoles, inflammation (lymphocytes and macrophages), fibrosis and neovascularization by capillary density (scale from 0 to 5). The scientific design of this project was approved by the animal ethics committee of the Paulista State University – Unesp – Botucatu Medical School, under the protocol CEUA 1240/2017.

T Student tests for independent samples were applied to Volume and Mass measurements obtained from the explanted xenografts. In order to compare Fragmented Fat and Lipoaspirate in both "Dry" and "Tumescent" groups, those numbers were handled by mean and standard error with a 5% statistical significance level ($p<0.05$). No significant difference, regarding mass and volume, was found between Frag Fat and Lipospirate in both groups (Figure 2A and B).

Statistical treatment of the histological evaluation data on the Dry Group (FFd and LAd) did not show any difference regarding inflammation, fibrosis and neovascularization. Nevertheless, Dry Lipoaspirate showed significant higher grades for cell integrity and lower grades for cyst/vacuole formation when compared to Dry Fragmented Fat. On the Tumescent Group (FFt and LAt), there was no significant difference for cell integrity, inflammation and neovascularization, while Tumescent Fragmented Fat showed significant lower cyst/vacuole formation and higher fibrosis in comparison to Tumescent Lipoaspirate (Figure 2C and D).

We used the same anatomic donor area of one single patient thus eliminating inter subject variability on adipose tissue regarding regenerative potential and subsequent lipotransfer retention[2]. Scapel skin resection and fat trimming made it possible to include the whole thickness of the subcutaneous tissue with connective structures, usually not incorporated by conventional suction[3]. The fragmentation device may apply different hole sizes on the distal plate (we used 2,0 mm) providing the possibility of injecting the material through different cannula sizes, according to possible areas to be treated (face, breast, butt…). Although it was not specifically targeted by our method, it is clear that fragmentation takes less time and physical efforts, obtaining greater amounts of lipograf than the traditional liposuction, especially if we consider the massive weight loss patients with deflated and sparse adipose tissue.

As we do not have available nude mice in our lab facilities, regular Wistar rats were used instead, with daily cyclosporine injections to induce the desired immune suppression as previously described.[4] We recognize the athymic mice model as most appropriate for this type of research and look forward to further experiments reducing the amount of injected fat tissue and extending the time for graft survival assessment to around 12 weeks.[5]

The mechanics involved in the fragmentation process seems to incorporate more than just adipose cellular content, but its collagenic scaffold structures as well. An increasing body of evidence supports the location of matrix-related fibroblasts, fast response angioblasts and a migrating monoblastic response within the perivascular scaffold. The ability to readily procure adipose tissue fragments amenable to research is also a legitimate and promising approach.

Fat Fragmentation converted apronectomy tissue into a new source of viable, injectable lipograft, with similar retaining behavior of traditional hand-held syringe lipoaspirate. Further investigations are necessary towards its indication for tissue augmentation as well as possible healing and regenerative applications.

Financial disclosure statement

None of the authors have a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

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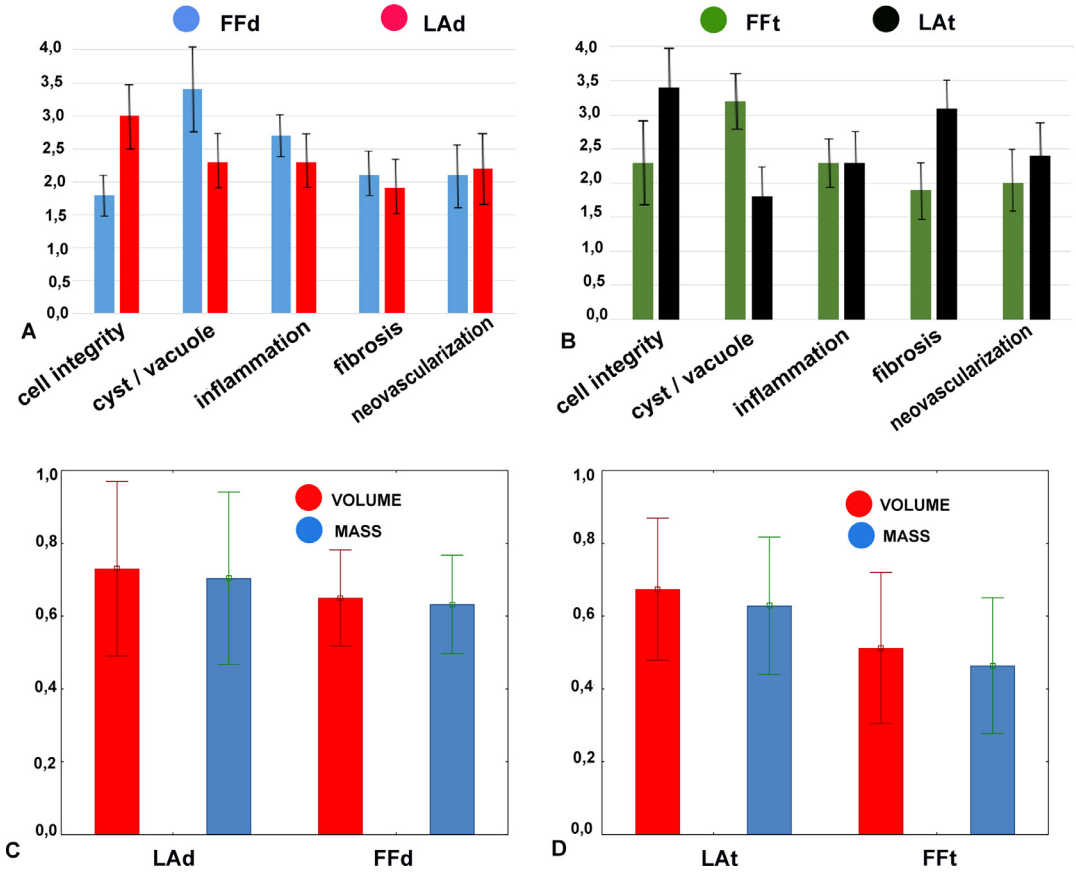

Figure 2 Dry and Tumescent groups comparisons of Lipoaspirate and Fragmented Fat retained grafts. **A,B:** Histologic characteristics. **C,D:** Volume and Mass data.

Supplementary material

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.bjps.2019.02.001.

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A 13-year review of plastic and hand surgery research funding by the National Institute of Health Research

Dear Sir,

In 2012 the Royal College of Surgeons of England (RCS) launched a clinical trials initiative to increase the quantity and quality of clinical surgical research. The British Association of Plastic, Reconstructive and Aesthetic Surgeons (BAPRAS) and British Society for Surgery of the Hand (BSSH) supported the initiative by appointing a Surgical Specialty Lead and the development of the Reconstructive Surgery Trials Network (RSTN) in 2013. The RSTN enables access to methodological support from six United Kingdom (UK) surgical trials centres and established the infrastructure to deliver multicentre studies based on the UK trainee collaborative model. Subsequently, the BSSH funded a Clinical Professor of Hand Surgery at the University of Nottingham who set up the Centre for Evidence Based Hand Surgery and Hand Fracture Research Group. In 2017 the BSSH funded James Lind Alliance (JLA) Priority Setting Partnership on hand and wrist conditions published their top 10 research priorities.[1] Simultaneously BAPRAS launched a modified Delphi research prioritization exercise that published the associations top 10 areas of research focus.[2] In addition there has been increased RCS support for research training and since 2013 the BSSH and BAPRAS have established training sessions at their scientific meetings and an annual RTSN research day. The National Institute for Health Research (NIHR) is the nation's largest funder of health and care research. It is primarily centred on England, yet works closely

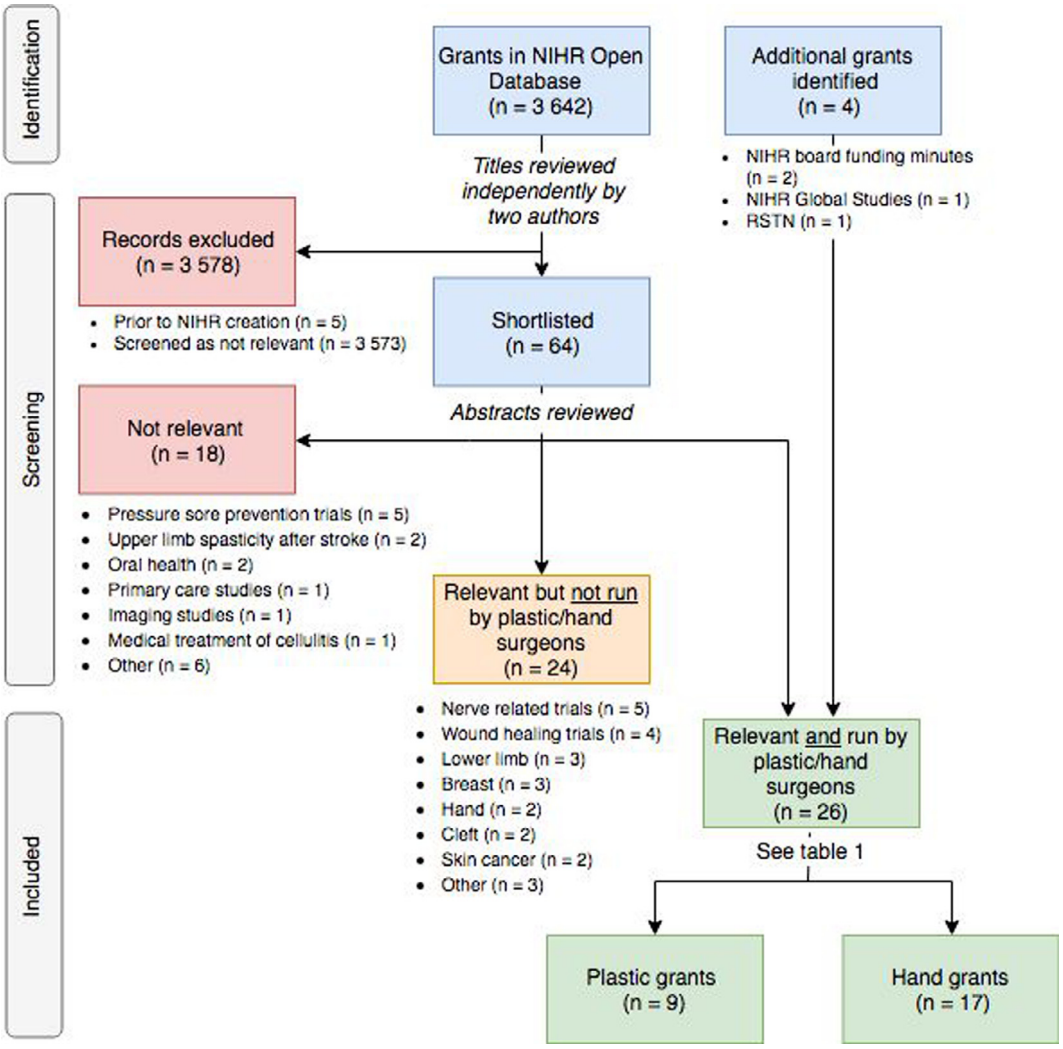

Figure 1 Flow diagram of methodology for identifying NIHR funded grants in plastic and hand surgery. The full details of plastic and hand grants included are outlined in Table 1.

Table 1 NIHR grants in plastic and hand surgery. All the grants listed had significant engagement of a plastic or hand surgeon. Abbreviations used are HTA = Health Technology Assessment, RfPB = Research for Patient Benefit, i4i = Invention for Innovation, IAT = Integrated Academic Training Programme. Individual grant figures rounded to nearest £100 and yearly total rounded to nearest £100,000.

Year	NIHR grant	Type of project		Type of grant	Money awarded	Total
		Plastic	Hands			
2006	Genetics of Dupuytren's disease (Manchester)		x	IAT	£727 100	*n* = 1 £0.7 m
2009	Recovery of sensory/motor function post carpal tunnel (Norwich)		x	NIHR Fellowship	£378 300	*n* = 1 £0.4 m
2010	RCT in K-wires vs. locking plate distal radius fracture (Warwick)		x	HTA	£1 300 500	*n* = 2 £1.5 m
	DRIFT - Distal Radius Internal Fixation Trial (North Wales)		x	RfPB	£236 400	
2013	Improving management of carpal tunnel (Leicester)		x	NIHR Fellowship	£542 400	*n* = 3 £2.9 m
	SWIFTT – cast vs. fixation in scaphoid fracture trial (Leicester)		x	HTA	£2 284 700	
	In-Practice Fellowship on carpal tunnel (Keele)		x	IAT	£111 000	
2014	Nerve conduit with novel polymer (Manchester)	x		i4i	£818 800	*n* = 2 £1.2 m
	Garments for burns scars (Birmingham)	x		HTA	£417 900	
2015	DRAFFT – Distal radius fixation trial (Oxford)		x	HTA	£66 000	*n* = 5 £1.0 m
	iBRA – implant breast reconstruction evaluation (Bristol)	x		RfPB	£243 400	
	SILKIE – skin grafting in burns with low friction environment (Bristol)	x		RfPB	£237 400	
	Needle fasciotomy vs. limited fasciectomy for Dupuytren's (Nottingham)		x	RfPB	£259 800	
	Heat to improve wound healing after breast reconstruction (London)	x		RfPB	£216 500	
2016	REACTS – returning to work after carpal tunnel release (Southampton)		x	NIHR Fellowship	£284 400	*n* = 5 £4.3 m
	DRAFFT2 – Distal radius fixation trial 2 (Oxford)		x	HTA	£1 248 600	
	Outcomes from common hand conditions (Oxford)		x	NIHR Fellowship	£335 200	
	DISC – Dupuytren's surgery vs. collagenase RCT (Leicester)		x	HTA	£1 942 000	
	COSBY – burns in young people outcome measures (Bristol)	x		NIHR Fellowship	£531 300	
2017	NINJA – Nail bed injury analysis trial (Oxford)		x	RfPB	£348 600	*n* = 2 £2.3 m
	Global health research on burn trauma (Swansea)	x		Global	£1 997 600	
2018	Decision making in hand surgery (Oxford)		x	NIHR Fellowship	£415 400	*n* = 5 £3.3 m
	Sys-Stem – fat transfer for oro/facial fibrosis is systemic sclerosis (London)	x		RfPB	£246 000	
	POINT – proximal phalanx fracture fixation trial (Nottingham)		x	HTA	£1 400 000	
	THESEUS – Hidradenitis suppurativa study (Cardiff)	x		HTA	£660 300	
	MRI for diagnosing traumatic brachial plexus injuries (Leeds)		x	NIHR Fellowship	£544 600	

with other administrators around the UK. Given the increase in clinical research support in plastic and hand surgery, the aim of this study was to document the success of obtaining NIHR grants for plastic and hand surgery research.

Two reviewers independently screened all 3642 awarded grants in the NIHR Open Database (2006–2019)[3] and NIHR website funding entries [4,5] against a priori list of definitions of plastic and hand (including wrist) surgery to establish a shortlist (Figure 1 and Table 1). All shortlisted grant abstracts were reviewed and consensus made to if the grant was truly relevant to plastic and hand surgery. Of those relevant, the background of each grant's principle investigator was established to identify if the grant had significant engagement of a plastic or hand surgeon or was run by another specialty (Figure 1).

In the 7 years prior to 2013 there were four hand surgery funded NIHR grants totalling £2.6 m. In the 6 years after 2013 there were 22 NIHR grants totalling £15.2 m of which 13 were in hand surgery and nine in plastic surgery (Table 1). The total NIHR grant investment in plastic (£5.4 m) and hand surgery (£12.4 m) represents approximately 0.5% of the £2.5 billion awarded overall. Grants awarded to all NIHR programmes and all specialties have increased from 20 grants in 2006 to approximately 350 per year from 2010 onward. Recently plastic and hand surgery have been awarded a higher proportion of these grants increasing from 0.5% and 0.7% in 2009 and 2010, respectively, to 1.4% and 1.6% in 2015 and 2016, respectively.

Establishing a national clinical research culture takes time and clearly this increase has not been solely down to the initiatives described. However, since 2015 there have been seven RSTN and Nottingham supported projects awarded NIHR grants. Furthermore, the BSSH JLA project has supported an NIHR Health Technology Assessment (HTA) commissioned call in digital nerve repair and at least two further NIHR HTA hand surgery applications; the outcomes of which will be known later in 2019. Support from the trials units has been crucial and may not have been as accessible had it not been for the RCS investment in them.

An observation was that the 24 grants related to plastic and hand surgery but run by other specialtiestotalled £19.0 m. These grants covered wound healing, cleft surgery, skin cancer, lower limb trauma, tissue engineering and breast surgery (Figure 1). Funding for these grants was higher than that achieved by plastic and hand surgeons and therefore represents areas that plastic and hand surgeons could lead on in the future.

Our data does not show unsuccessful NIHR applications, which are considerable, given the high attrition rate of the NIHR awards process. A limitation of our study is that we only looked at grants secured from the NIHR (as they are the largest source of clinical research funding) but there are other funders that support research as well as industry funding. Furthermore, while our study looked only at successful NIHR grant applications, smaller studies do get NIHR portfolio support through the Clinical Research Network as well as NIHR funded Academic Clinical Fellow and Lecturer positions.

There is still a long way to go but with the support of national bodies, plastic and hand surgeons in the UK have demonstrated that a difference can be made to the quality and quantity of clinical research.

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Conflict of interest

Abhilash Jain is the Royal College of Surgeons Surgical Specialty Lead for plastic and hand surgery, founded and leads the Reconstructive Surgery Trials Network and was a member of both the BAPRAS Delphi project and the BSSH James Lind Alliance Priority Setting Partnership teams.

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