Peer Review File

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Review Comments

Reviewer A

Comment 1: I congratulate the authors for the review, based on their well-known experience in microsurgical breast reconstruction.

Reply 1: We thank the reviewer for their encouraging feedback and are grateful that the manuscript was well received.

Changes in the text: No changes

Reviewer B

Comment 1: This is a lovely experience of breast reconstruction by an experienced surgeon. It would be worthwhile to publish this as an editorial piece.

Reply 1: Thank you for this great feedback. The article was written as an invited review for a Special Issue on "Hot Topics in Breast Reconstruction". We would be delighted for this to be considered as an editorial, however the body of the text is currently over 4,500 words and according to the author guidelines this is supposed to be 2,500 words. We believe this will significantly reduce the content and the impact we wish to have with this article. As such, we have submitted this as a Clinical Practice Review and have mentioned this in the abstract. This would, according to the Author Guidelines, provide more freedom to the authors to structure the text as required.

Changes in the text: In this clinical practice review article, we provide an overview of current autologous reconstruction methods, with a focus on minimising donor site morbidity and enhancing the aesthetic result of the donor site. We discuss key concepts in autologous reconstruction and provide surgical pearls for performing the procedure effectively with optimal reconstructive and aesthetic result.

Comment 2: It is important to highlight that this is not a scientific piece, with no presented methods or results, and as such is not a "review" piece as it was submitted as.

Reply 2: Thank you for this feedback again. As mentioned above, we will submit this is as a Clinical Practice Review to ensure this corresponds to the journal's Author Guidelines.

Changes in the text: In this clinical practice review article, we provide an overview of current autologous reconstruction methods, with a focus on minimising donor site morbidity and enhancing the aesthetic result of the donor site. We discuss key concepts in autologous reconstruction and provide surgical pearls for performing the procedure effectively with optimal reconstructive and aesthetic result.

Comment 3: As an editorial, I would suggest some "pearls" from the senior author to improve the piece.

Reply 3: Thank you for this feedback. As mentioned above, we will submit this is as a Clinical Practice Review to ensure this corresponds to the journal's Author Guidelines. However, we have added some pearls at the end of the text so these points are well highlighted to the reader.

Changes in the text: Pearls from the authors:

1) Ensure appropriate planning: this includes a thorough clinical examination, donor site selection and planning of aesthetic closure, thorough CT angiography study, and peri-operative care.

2) Ensure the procedure is done efficiently with a logical sequence of steps. Avoid damaging muscle, nerve, and other structures. The dissection should be neat, meticulous, and purposeful without disturbing adjacent tissue.

3) Closure of the donor site is of utmost importance as mentioned above. Make sure this is done in a proper way. Do this yourself or teach your residents on how to do this in a proper manner.

4) Lastly, have a well-trained team right from the front office till the discharge lounge. Everyone should be aware of the procedure and know

how they can contribute to making every patient journey a success.

Comment 4: If continued as a review, this will need major restructuring.
Reply 4: Thank you for this feedback. As mentioned above, we will submit this is as a Clinical Practice Review to ensure this corresponds to the journal's Author Guidelines. As such, we will be able to keep the content without reducing the word count to fit the article as an Editorial, and at the same time be able to maintain the structuring we have.
Changes in the text: We have highlighted that this is a Clinical Practice Review in the text (see above)

Reviewer C

Comment 1: Thank you for submitting a well-written and well-structured paper, providing the reader with a comprehensive overview of the topic with special emphasis on the donor-site. The paper also stresses the clinical focus on patient selection, as an increasing number of patients with genetic mutations or a predisposition to breast cancer will in the very near future need a breast reconstruction.
Reply 1: Thank you for this fantastic feedback. We are grateful that the article was well received.
Changes in the text: No changes.

Comment 2: Please use immediate instead of primary for immediate breast reconstruction.
Reply 2: Thank you for highlighting this point. We have changed this in the text.
Changes in the text:
Under "Challenges in DIEP flap reconstruction"
Especially with an increase in genetically predisposed women requesting risk-reducing mastectomy and ***immediate*** *autologous reconstruction, our patient population has changed and includes younger patients with different expectations and higher aesthetic demands.*
Under "Pre-operative considerations in autologous reconstruction"

*Whether or not the NAC needs to be moved upwards, is relevant in both risk-reducing mastectomies, as well as nipple-sparing mastectomies with **immediate** reconstruction, as the psychological importance of NAC preservation cannot be underestimated in **breast cancer** patients.*

Under "Goals of breast reconstruction with autologous tissue"

*A nipple-sparing mastectomy with **immediate** breast reconstruction may give an aesthetically pleasing result in one go and is likely on of the most elegant all-in-one procedures in plastic surgery.*

Under "Pre-operative protocol and marking"

*The midline, breast footprint, and previous scars are marked, as well as the planned incision on the breast in case of a mastectomy with **immediate** breast reconstruction.*

Comment 3: Finally, please add a short paragraph on patient-related outcome measures.

Reply 3: Thank you for this point. We do not have this data currently, but we are preparing this for a future publication.

Changes in the text: No changes.

Comment 4: The abstract covers the content of the review and prompts some of the key issues of the paper i.e. donor-site morbidity and how to minimize it by handling the fascia as well as the muscle and nerves properly. The mentioning of multiple surgeries (1-3) is important, too. Line 52: please provide a reference.

Reply 4: Thank you for this point. This has been done.

Changes in the text: Following reference was added - Damen THC, Mureau MAM, Timman R, Rakhorst HA, Hofer SOP. The pleasing end result after DIEP flap breast reconstruction: a review of additional operations. Journal of Plastic, Reconstructive & Aesthetic Surgery [Internet]. 2009;62(1):71–6. Available from: https://www.sciencedirect.com/science/article/pii/S1748681508000661

Comment 5: The introduction is well written and structured and diligently

builds up the main topics of the paper. Line 93: please exchange prosthesis with implant.

Reply 5: Thank you for this point.

Changes in the text: Until the early 1990s, the TRAM flap remained the most popular choice for autologous breast reconstruction, along with the option of a composite reconstruction using a pedicled latissimus dorsi (LD) flap with a silicone **implant.**

#Challenges with DIEP flap breast reconstruction

Comment 6:

Excellent idea to emphasize the particular requirements when dealing with patients with a disposition to breast cancer.

Line 125: please specify if planning is pre-operative planning or?

#Pre-operative considerations in autologous reconstruction

Comment 7: Line 187: the preservation on the NAC is important in all breast (cancer) patients.

Reply 7: Thank you for this point. We have changed this in the text.

Changes in the text:

Whether or not the NAC needs to be moved upwards, is relevant in both risk-reducing mastectomies, as well as nipple-sparing mastectomies with **immediate** reconstruction, as the psychological importance of NAC preservation cannot be underestimated in **breast cancer** patients.

Comment 8: Lines 211-218: please a reference, covering a more detailed description of the topic (for instance Zhou C et al. Alternative flaps for breast reconstruction. Annals of Breast Surgery 2023; 7: 19 (https://dx.doi.org/10.21037/abs-21-8).

Reply 8: Thank you for this point. We have added the reference.

Changes in the text:

Following reference was added - Zhou C, Van der Hulst R. Alternative flaps for breast reconstruction: a narrative review on using the thigh, buttocks, and back. Annals of Breast Surgery. 2023;7.

Comment 9: Line 222-223: please briefly mention the back side of the CTA – the radiation dose.

Reply 9: Thank you for this point. We have added this in the text.

Changes in the text:

This saves times in procedure planning and execution. In our centre, CTA is used in most cases, as this is readily available and a fast examination, **however, involves a radiation dose to patients.**

#Goals of breast reconstruction with autologous tissue

Comment 10: Lines 235-238: Please add a short mentioning of sensory restoration/nerve-sparing in nipple-sparing mastectomy (i.e. Peled et al. Sensory reinnervation after mastectomy. Ann Breast Surg 2022; 6: 27. https://dx.doi.org/10.21037/abs-21-9)

Reply 10: Thank you for this point. We have added this in the text and we have also added the suggested reference.

Changes in the text: The main goal in autologous breast reconstruction, and its biggest advantage, is to offer the patient a natural look and feel of the reconstructed breast. The softness, warmth, and natural feeling of a flap-based breast reconstruction is unmatched, compared to any implant-based reconstruction. The main considerations remain its lengthy and more complex procedure, and donor site morbidity. **Maintaining adequate sensation with nerve-sparing, along with nipple preservation, are part of providing patients with natural breasts, both in look and feel.**

Comment 11: Line 243: is likely one of the (the e is missing)

Line 244: a second operation is foreseen.

Lines 244-251: please avoid the word lipofilling – fat grafting is a more appropriate description of the procedure.

Lines 264-267: excellent to mention the team effort.

Reply 11: thank you for highlighting this. This has been changed in the text.

Changes in the text:

A nipple-sparing mastectomy with **immediate** breast reconstruction may give an aesthetically pleasing result in one go and is likely **one of the most** elegant all-in-one procedures in plastic surgery. In most patients, a second operation **is foreseen** 3 months after the breast reconstruction, which may entail one or several of the following procedures: nipple reconstruction (in case of skin-sparing mastectomy), contralateral breast symmetrisation (breast augmentation, mastopexy or reduction), breast **fat grafting**, flap liposuction (in case of excess volume or partial fat necrosis), scar corrections (at the breast and/or donor site), and adjustments to the footprint. In a limited number of patients, a third operation may be planned for additional **fat grafting** or smaller adjustments.

#Step-by-step DIEP flap breast reconstruction with aesthetic closure of the abdominoplasty flap donor-site.

Comment 12: Lines 279-283: please comment on the optimal incision for the mastectomy and add a reference (preservation of the blood supply to the skin-envelope)

Reply 12: Thank you for this point. We have added this in the text.

Changes in the text: Marking begins with the patient in standing position and is usually done the evening before surgery (Figure 1a). The midline, breast footprint, and previous scars are marked, as well as the planned incision on the breast in case of a mastectomy with **immediate** breast reconstruction. In case of a skin-sparing mastectomy, an inverted T incision line is preferred with removal of the NAC, however, a horizontal elliptical incision can be done in high-risk patient (including significant ptotic breast, heavy chronic smoker, and diabetic patient). In case of a nipple-sparing mastectomy, either a medial areolar-vertical or inverted-T incision is used in large breasts; or an inframammary fold incision for small size breasts (figure 1b). **Where possible, inframammary fold incisions are made more laterally to avoid sacrificing the fifth anterior intercostal artery perforator and maximising the blood flow to the mastectomy flaps.** Respecting the footprint of the breast is important to avoid peri-operative detachment of the inframammary fold ligament or medial breast

attachment, which may influence final breast shape and position.

Comment 13: Line 348: Q-tips are not is.
Reply 13: Thank you for this point. We have altered this in the text.
Changes in the text: Q-tips are very useful to free perforators and nerves **as well** (figure 3b).

Comment 14: Lines 361-362: please add a reference.
Reply 14: Thank you for this point. We have added a reference.
Changes in the text: Following reference was added - Hilven PH, Vandevoort M, Bruyninckx F, De Baerdemaeker R, Dupont Y, Peeters Q, et al. Limiting the fascia incision length in a DIEP flap: repercussion on abdominal wall morbidity. Journal of Plastic, Reconstructive & Aesthetic Surgery. 2022;75(3):1108–16.

Comment 15: Lines 368-369: please emphasize the use of ICG – as it has been shown to reduce flap-related complications (see references Laurtizen et al. JPRAS 2021;74:1703-1717 + Varela R et al. PRS 2020; 145:1)
Reply 15: Thank you for this point. We have added the references and modified the text.
Changes in the text:
The text now reads –
Indocyanine Green imaging is used to assess for flap perfusion in cases of doubt **and has become a useful tool in recent years.**
Following references were added:
Lauritzen E, Damsgaard TE. Use of Indocyanine Green Angiography decreases the risk of complications in autologous-and implant-based breast reconstruction: A systematic review and meta-analysis. Journal of Plastic, Reconstructive & Aesthetic Surgery. 2021;74(8):1703–17.
Varela R, Casado-Sanchez C, Zarbakhsh S, Diez J, Hernandez-Godoy J, Landin L. Outcomes of DIEP flap and fluorescent angiography: a randomized controlled clinical trial. Plast Reconstr Surg. 2020;145(1):1–10.

Schols RM, Dip F, Menzo E Lo, Haddock NT, Landin L, Lee BT, et al. Delphi survey of intercontinental experts to identify areas of consensus on the use of indocyanine green angiography for tissue perfusion assessment during plastic and reconstructive surgery. Surgery. 2022;172(6):S46–53.

#Alternative sites for autologous reconstruction

Comment 16: Lines 450-464: please comment on intra-operative positioning – especially in bilateral cases.

Reply 16: Thank you for this point. We have made modifications in the text

Changes in the text: The lumbar area is another excellent donor site, providing thick tissue for autologous breast reconstruction. The lumbar artery perforator (LAP) flap is an excellent match for breast tissue and provides ample volume. Issues with the LAP flap are its short pedicle length as dissection is limited to the transverse vertebral processes to avoid injury to the spinal nerves, thereby requiring interposition grafts (usually the DIEA/V are used). Furthermore, the LAP flap has a smaller vessel calibre, tedious dissection, high seroma rate, and requires patient repositioning (65). A more experienced surgeon may complete the full surgery in the lateral position; however, this can be trickier for less experienced surgeons. **We previously did these cases in the lateral position. However, with increased efficiency in position changes and better surgeon comfort, our current practice is to perform the procedure in supine-prone-supine. The supine position initially allows chest vessel preparation and interposition graft harvest. Hereafter, the patient is placed prone for flap dissection, and then again supine for anastomosis and flap inset.**

#Future considerations

Comment 17: Brilliant to mention AI.

#CONCLUSIONS

Comment 18: Are fully justified and sum up the paper.

#REFERENCES

Comment 19: The references comprise the entity of the current literature, apart from the ones mentioned above.

#FIGURES

Comment 20: The figures are very instructive and illustrate the step-by-step paragraph in the paper and the surgical pearls.