Peer Review File

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Reviewer Comments

Reviewer A

Comment: May I suggest addition of a segment depicting endo-robotic approaches towards autologous flap reconstruction? Given that this is increasingly common worldwide practice with it's well reported overall benefits

Reply: We added a section about endo-robotic approaches for DIEP flaps starting page 6 line 149

Change in the text: "

Endo-robotic approach for DIEP flap harvest

The robotic approach comes from the desire to optimize the DIEP harvesting, especially when it comes to the pedicle length and the incision of the aponeurosis. First reported by Gundlapalli et al. in 2018, the usage of the Da Vinci® robot system to harvest deep inferior epigastric vessels is becoming more and more popular for the many benefits it can provide (28). The minimally invasive technique allows, as early experience suggests, smaller recovery time and less overall postoperative pain (29). In a retrospective study which included 207 patients in total (21 in the robotic DIEP group versus 186 in the regular DIEP group), Lee M. J. et al. found a significant reduction in postoperative pain ($p = 0.001$) and reduction of mean hospital stay length ($p = 0.002$)(30). This technique allows the surgeon to harvest the longest possible pedicle length (10 to 15cm) while performing a very small incision on the abdominal fascia, ranging from 1.5 to 3cm (29). However, the financial cost is substantially higher, and surgeons will need additional training to master this new skill (29,30). Thus, the robotic DIEP flap cannot be universally used and the patient selection is a crucial part. Ideally, perforators must be of short intramuscular course and of a small number (ideally 1-2), identified on the preoperative CT-scan (29). Otherwise, the required dissection will be greater, and the benefits from using afterwards a minimally invasive approach are reduced (29,31). The surgeon must dissect around the perforators till the posterior sheath. Then, they inflate the abdominal cavity (29). After, the surgeon installs three ports through the fascia on the contralateral side of the flap and located on a line

connecting the anterior superior iliac spine and the anterior axillary line. Then, the robotic dissection of the pedicle begins till they reach the perforator. The pedicle can then be dissected till the external iliac vessels and be clamped. It is recommended to close the posterior sheath with a barbed suture (29).

Reviewer B

Comment 1: Some language errors need to be corrected

Reply 1: We review the whole manuscript and made the corrections of grammatical errors as well as the misprints.

Change in the text 1: the corrections have been highlighted.

Comment 2: Method: In addition to TUG, transverse myocutaneous gracilis flap (TMG) should be used in the search, as well as IGAP and FCI flap.

Reply 2: We added transverse myocutaneous gracilis flap (TMG) and FCI flap in the Table 1 and in the Method paragraph. No differences were found with those new keywords in terms of new information to add in the review.

Change in the text 2:

Page 3 Line 67 : "deep inferior epigastric perforator flap", "DIEP", "transverse upper gracilis", "TUG", "Transverse Myocutaneus Gracilis Flaps", "TMG", "superior gluteal artery perforator", "SGAP", "inferior gluteal artery perforator", "IGAP", "free fasciocutaneous infragluteal", "FCI flap", "latissimus dorsi flap", "latissimus dorsi", "LD", "autologous fat graft", "lipofilling", "lipomodeling", "Breast Q", "complications" and "nipple-areola complex reconstruction" (Table 1)

Comment 3: Citation for Hartrampf is not correct (l.144). First description of DIEP flap was by Koshima, 1989: Koshima I, Soeda S. Inferior epigastric artery skin flaps without rectus abdominis muscle. Br J Plast Surg. 1989 Nov;42(6):645-8.

Reply 3: We corrected the reference for Hartrampf, and we corrected the first description of the DIEP flap with the reference.

Change in the text 3:

Page 5 line 125 : "The DIEP flap was first described in 1989 by Koshima and Soeda (16) to reduce the abdominal wall weakening."

Page 17 line 486 “(16) Koshima I, Soeda S. Inferior epigastric artery skin flaps without rectus abdominis muscle. Br J Plast Surg. 1989 Nov;42(6):645–8.”
Page 17 line 479 “(13) Hartrampf CR, Scheflan M, Black PW. Breast reconstruction with a transverse abdominal island flap. Plast Reconstr Surg. 1982 Feb;69(2):216–25.”

Comment 4: L180: Where is the evidence?
Reply 4: Oversizing the flap is part of our daily practice in case of subsequent radiotherapy after this observation we consistently made. Many of plastic surgeon confreres in different countries to do the same. We specified in the same sentence that no evidence of difference was found in the literature [radiotherapy vs no radiotherapy] : “even though no increase in complication rates of fat necrosis, surgery for removal of fat necrosis was reported in the literature (25)”

Comment 5: L190: Holmström described the first free TRAM flap in which he included the contralateral SIEV: Holmström H. The free abdominoplasty flap and its use in breast reconstruction. An experimental study and clinical case report. Scand J Plast Reconstr Surg. 1979;13(3):423-27.
Reply 5: We corrected that sentence and added the reference
Change in the text 5:
Page 7 line 178 ” Holmström described in 1979 the first use in superficial inferior epigastric vessels in breast reconstruction with a free TRAM flap in which he included the contralateral SIEV (35)”
Page 18 line 535 “(35) Holmström H. The free abdominoplasty flap and its use in breast reconstruction. An experimental study and clinical case report. Scand J Plast Reconstr Surg. 1979;13(3):423–7.”

Comment 6: Arnez described the SIEA flap for the breast after it was used for the hand following anatomical studies by Taylor: Arnez ZM et al. Breast reconstruction using the free superficial inferior epigastric artery (SIEA) flap. Br J Plast Surg. 1999;52(4):276-9.
Reply 6: We corrected that error we made regarding the history of SIEA flap and added the reference.
Change in the text 6:

Page 7 line 179: “After Taylor conducted anatomical studies, Arnez et al. published the SIEA flap applied to the breast reconstruction in 1999 (36)”
Page 18 line 537: “36. Arnez ZM, Khan U, Pogorelec D, Planinsek F. Breast reconstruction using the free superficial inferior epigastric artery (SIEA) flap. Br J Plast Surg. 1999 Jun;52(4):276–9. “

Comment 7: With the SIEA flap, the pedicle sometimes runs above the Scarpa, it depends on the incision level. It is a hemi-abdominal flap. well used in bilateral reconstructions (DIEP and SIEA, e.g.)
Reply 7: We clarified the hemi-abdominal aspect and completed the mentioned above information.
Change in the text 7:
Page 7 line 176 : “The SIEA flap is a lower hemi-abdominal flap which involves a less extensive dissection compared to DIEP flap since it does not require the opening of the rectus sheath (34)”
Page 7 line 182: “This pedicle runs in the lower abdominal fat tissue under the Scarpa or sometimes above the Scarpa, depending on the level of incision.”

Comment 8: L.211: Please quote Olivari adequately. Olbrisch not Olbrich
Reply 8: We added the reference for Olivari We corrected the typo on Olbrisch.
Change in the text 8:
Page 8 line 204 : “After its first description in 1906 by Tansini, it was only in 1976 that Olivari rediscovered it (4)”
Page 8 line 205 : “Then, Mühlbauer and Olbrisch 1977 developed its use to provide muscle coverage of the silicone implant and breast skin replacement (38,39).”
Page 18 line 530: “4.Olivari N. The latissimus flap. Br J Plast Surg. 1976 Apr;29(2):126–8.”

Comment 9: L245: not believe, know!
Reply 9: We modified the sentence and justified it with an additional reference.
Change in the text 9:
Page 9 line 238 : “This technique has the advantage of bringing more volume to the reconstruction, but it tends to give an asymmetrical aspect of the back in comparison

with muscle-sparring LD flap (which consists of harvesting only of strip of muscle around the descending branch) (49,50)."

(50) Kim H, Wiraatmadja ES, Lim SY, Pyon JK, Bang SI, Oh KS, et al. Comparison of morbidity of donor site following pedicled muscle-sparing latissimus dorsi flap versus extended latissimus dorsi flap breast reconstruction. J Plast Reconstr Aesthet Surg. 2013 May;66(5):640–6.

Comment 10: L261: Please substantiate with citation.

Reply 10: we modified the sentence : 11% instead of 10% and added the reference

Change in the text 10:

Page 9 line 256 : "The harvest of the gracilis muscle has no consequence for walking function because it is an accessory adductor contributing only 11% of the adduction motion (52)."

Page 19 line 577: "(52) Deutinger M, Kuzbari R, Paternostro-Sluga T, Quittan M, Zauner-Dungl A, Worseg A, et al. Donor-site morbidity of the gracilis flap. Plast Reconstr Surg. 1995 Jun;95(7):1240–4."

Comment 11: L264: depends on the incision: crease vs. thigh

Reply 11: We added the other denomination of the TUG flap : TMG flap.

Change in the text 11:

Page 9 line 251: "The TUG flap (also called transverse myocutaneous gracilis flap) is harvested from the inner thigh and consists of the gracilis muscle (Figure 5a, 5b, 5c) and a skin paddle, while the PAP flap is harvested from the inner and posterior aspects of the upper thigh."

Page 9 line 261 : " To avoid the contour deformity and the labial spreading, the superior incision should be placed 1 to 2 cm below the inguinal crease (55)."

(55) Buchel EW, Dalke KR, Hayakawa TE. The transverse upper gracilis flap: Efficiencies and design tips. Can J Plast Surg. 2013;21(3):162–6.

Comment 12: For me PAP, TUG and TMG are workhorse flaps in appropriate indications, also in alternative to DIEP.

Reply 12: We removed "Those two flaps are not used in common practice" and modified the paragraphs as follows:

Change in the text 12:

Page 9 line 262: " Indeed, their pedicles remain quite shorter compared to the DIEP flap (average of 9.4 cm for PAP, 6.4 cm for TUG versus 15 cm for DIEP) and smaller caliber of artery (average of 2.0 mm for PAP, 1.5 for TUG versus 2.1 for DIEP) (56,57). In addition, the volume brought to the breast is small to moderate. Moreover, they do not allow a large resurfacing of the breast because of a limited-size skin paddle. Bilateral TUG flaps to reconstruct one breast were reported with the aim of adding volume. In that case, vascular connections are made in the internal mammary vessels, anterograde for one flap and retrograde for the second one (58).

The TUG flap and PAP flap may be the preferred initial option in alternative to DIEP flap depending on volume offered by the donor site, on the surgeon's experience and if the volume of the breast to reconstruct is small to moderate. However, in our practice we use the TUG flap only when necessary. Regarding the PAP flap, we tend not use it because of its firm texture, unlike the fat of the TUG flap, which is soft, allowing a more natural texture, in addition to the short pedicle and small vessel caliber of the PAP flap."

Comment 13: Chapter D. IGAP and FCI flaps are missing here.

Reply 13:

We already mentioned the IGAP flap the Method (Page 3 line 69) and the **Flaps from the gluteal region (**Page 10 line 280)**.** Regarding the FCI flap, we added the following paragraph.

Change in the text 13:

Page 11 line 298 : "The free fasciocutaneous infragluteal flap (FCI) is another flap that can be elevated from the infragluteal crease (65) and vascularized by the descending branch of the inferior gluteal artery (66). The presence of the posterior cutaneous femoral nerve alongside the vascular pedicle allows for potential of a sensory flap transfer (67). However, the FCI flap is not commonly employed for breast reconstruction."

Comment 14: Recently, free NAC transplantation has gained in importance again. Should be mentioned e.g. Fansa, H. et al. Autologous Breast Reconstruction with Free Nipple-Areola Graft after Circumareolar (Skin Reducing) Mastectomy. J. Pers. Med.

2022, 12, 1588. https://doi.org/10.3390

Reply 14: We added a paragraph on NAC grafting, including the above mentioned reference

Change in the text 14:

Page 13 line 372 "Finally, the free nipple-areola graft is a technique employed in immediate breast reconstruction for skin-sparing mastectomies. (85). It is indicated in risk-reducing mastectomies and in certain oncological with oncologic safety (85–87). Better results are obtained when a circumareola incision is possible. However, the position of the nipple-areola complex is difficult in case of large breasts or significant ptosis (88). In those cases, secondary areola pigmentation has its rightful place."

Page 21 line 659: "85. Fansa H, Linder S. Autologous Breast Reconstruction with Free Nipple-Areola Graft after Circumareolar (Skin Reducing) Mastectomy. J Pers Med. 2022 Sep 26;12(10):1588."

Comment 15: Honestly, the figures seem old and the results are not the best.

Reply 15: The figures are all recent cases, except for the TRAM flap which is no longer used in our centres and the IGAP flap which is rarely employed in our practice.