

## Peer Review File

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### **Reviewer Comments**

**In the era of healthcare cost control and the ongoing limitations of gender affirmation coverage, could the authors expand on the cost comparison between an implant vs microvascular autologous reconstruction. Your team does make a point about cost comparison in mastectomy patients but these are very different operations than a chest feminization procedure.**

*Reply: There are currently no published cost comparison studies looking at implant-based vs autologous breast reconstruction/feminization in transgender women. This procedure is performed rarely and thus formulating such a systematic comparison would be extremely difficult, at best. The closest approximation we have to comparing cost is in the breast reconstruction of cisgender women. There are several studies and meta-analyses looking at cost vs outcomes in this population [1-3]. The majority of these papers indicate that over the long term, in experienced hands, autologous procedures have fewer reoperations, readmissions and carry similar overall cost. We acknowledge that implant-based breast augmentation is somewhat different than direct-to-implant reconstruction, but this is the best comparison we have. The authors wish to emphasize that a very small number of patients would be appropriate candidates for autologous breast feminization and thus societal cost would be comparatively low when compared to the per capita cost of autologous reconstruction for breast cancer. We concur that gender-affirming care is limited in some parts of the world and within the United States, however in our region of*

*the United States, the majority of gender-affirming procedures are covered by all payors, including breast feminization. We have not encountered any difficulty with payors in regard to autologous or mixed implant-autologous forms of breast reconstruction in transgender women when it can be medically justified as described in this paper. We have also not seen a push to limit access to autologous breast cancer reconstruction in the name of cost control.*

*References (also added to text as refs 20, 21, 22 Line 183-184):*

- 1. Fischer JP, Wes AM, Nelson JA, Basta M, Rohrbach JI, Wu LC, Serletti JM, Kovach SJ. Propensity-matched, longitudinal outcomes analysis of complications and cost: comparing abdominal free flaps and implant-based breast reconstruction. J Am Coll Surg. 2014 Aug;219(2):303-12. doi: 10.1016/j.jamcollsurg.2014.02.028. Epub 2014 Apr 8. PMID: 24916480.*
- 2. Sando IC, Momoh AO, Chung KC, Kozlow JH. The Early Years of Practice: An Assessment of Operative Efficiency and Cost of Free Flap and Implant Breast Reconstruction at an Academic Institution. J Reconstr Microsurg. 2016 Jul;32(6):445-54. doi: 10.1055/s-0035-1571197. Epub 2016 Feb 12. PMID: 26872025.*
- 3. Khajuria A, Prokopenko M, Greenfield M, Smith O, Pusic AL, Mosahebi A. A Meta-analysis of Clinical, Patient-Reported Outcomes and Cost of DIEP versus Implant-based Breast Reconstruction. Plast Reconstr Surg Glob Open. 2019 Oct 28;7(10):e2486. doi: 10.1097/GOX.0000000000002486. PMID: 31772906; PMCID: PMC6846300.*

**Can the authors provide a table of the benefits and disadvantages of implant vs autologous reconstruction and how the aesthetic goals are reach with microvascular reconstruction.**

*Reply: Below is a table comparing the advantages of implant-based reconstruction versus autologous reconstruction. However, we would like the emphasize that autologous procedures should not be an option for every patient. We do agree that implant-based reconstruction is the standard of care and will be used in most patients undergoing chest feminization surgery. Autologous reconstruction remains an option only for patients whose goals will not be met with implant-based reconstruction.*

*We have modified our text and added a table, please see lines 165-168 and Table 1.*

**Implant vs autologous reconstruction**

<b>Advantages of implant-based reconstruction</b>	<b>Advantages of autologous reconstruction</b>
Shorter anesthesia time	More natural-appearing breast shape and ptosis
Lower cost of index surgery	Long term similar or lower cost (refs 20-22) due to fewer reoperations, no need for staged approach (e.g., tissue expansion)
Requires a single surgical site	Eliminates risk of animation deformity

Does not require a sufficient donor site	May be able to conceal aspects of transgender female anatomy more than implant-based reconstruction (IMF placement, nipple to IMF distance, laterally placed nipples)
Less invasive, microsurgical skill not required	Less challenging than implant-based reconstruction in patients with surgical scars or other anatomic deformity
Does not require hospital admission	Eliminates risk of BIA-ALCL, BII, implant infection, implant rupture, implant migration

**Can you expand on a table with your indications for microvascular reconstruction in transgender patients, Is it just patient preference?**

*Reply: The manuscript outlines in detail the indications for autologous breast reconstruction, which apply to a small minority of transgender women. Please refer to the section entitled “Cisgender versus Transgender Breast Feminization: Anatomy and Challenges.” If a patient’s goals can be achieved with implants, implant-based reconstruction will be performed. Autologous reconstruction will only be offered to the patient if there are contraindications to implant-based reconstruction or if there is no other way to achieve the patient’s goals.*

*The text has been modified (line 165-168) and the table below has been added as Table 2.*

<b>Potential Indications for Autologous Reconstruction</b>
Poor skin envelope elasticity despite attempt at expansion
Prior chest wall scars or trauma obviating implants
Unable to achieve patient goals with implant-based reconstruction
Unable to achieve symmetry due to pre-existing anatomic deformity
Repeated implant failure, capsular contracture or silicone granulomatosis

**You alluded to the fact that this is less than 1% of the population, does this justify the fact of providing a procedure that has a much higher cost and risk for this population, if so how?**

*Reply: As stated above: There are currently no published cost comparison studies looking at implant-based vs autologous breast reconstruction/feminization in transgender women. This procedure is performed rarely and thus formulating such a systematic comparison would be extremely difficult, at best. The closest approximation we have to comparing cost is in the breast reconstruction of cisgender women. There are several studies and meta-analyses looking at cost vs outcomes in this population [1-3]. The majority of these papers indicate that over the long term, in experienced hands, autologous procedures have fewer reoperations, readmissions and carry similar overall cost. In light of this, we do not think it is correct to label this procedure as bearing “much higher cost and risk.” We acknowledge that implant-based breast augmentation is somewhat different than direct-to-implant reconstruction, but this is the closest comparison we have, and probably not too far*

*from reality when you consider life-long risk of capsular contracture, implant rupture and need for reoperation as previously reported. The authors wish to emphasize that a very small number of patients would be appropriate candidates for autologous breast feminization and thus societal cost would be comparatively low when compared to the per capita cost of autologous reconstruction for breast cancer.*

**In your case presentation, why did you decided to remove the native skin envelope and NAC?  
Is pre-expansion a consideration to avoid the larger skin paddles?**

*Reply: To increase the nipple-fold distance, tissue expansion could have been performed which would add an additional stage to surgery, increasing cost and recovery time, not to mention the number of visits to the office for expansion. There is also no guarantee this would have worked as desired. Instead, repositioning the NAC by removing the tight lower pole skin and replacing with the plentiful flap skin allows the surgeon to place the NAC exactly where it appears most natural. This also allows us to create a degree of breast ptosis not commonly seen with implant-based augmentation.*