

Case Report

Treatment of Keloids from Gender-Affirming Mastectomy: A Case Report

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A transgender (trans) man is a trans person who was assigned female sex at birth. Some trans men undergo gender-affirming surgical procedures, particularly mastectomy. We present a case of keloid formation after gender-affirming mastectomy that highlights the importance of choosing the most appropriate mastectomy technique in patients at risk of keloid and the most effective therapeutic strategies for anterior-chest keloids. A 40-year-old Japanese trans man developed keloids along inverted-T mastectomy-induced anterior-chest scars. The keloids were completely excised, and the defects were closed by primarily using a layered technique. Starting the next day, the wounds were treated with radiotherapy over 3 consecutive days. The wounds/scars were carefully monitored and treated with continuous taping fixation for 1 year. There was no recurrence, and aesthetic outcomes at 18 months were good. To prevent keloids after gender-affirming mastectomy, surgeons must estimate individual risk of keloid formation. If the patient is young, of Asian or African descent, or has a personal or family history of keloids, surgical methods that leave long lateral scars on the anterior chest (e.g., the inverted T procedure) should be avoided. Tensionless or tension-reducing surgical techniques should also be used, along with postoperative radiotherapy, long-term taping or compression, close follow-up to detect early signs of keloid formation, and referral to a plastic surgery department if any scar induration or elevation is observed. Surgeons performing gender-affirming mastectomy can potentially reduce the risk of keloid formation by carefully considering these factors.

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Introduction

A transgender (trans) man is a trans person who was assigned female sex at birth. To align their physical characteristics with their gender identity, many trans men choose surgery. The most common gender-affirming surgery for trans men is mastectomy (top surgery), which significantly improves patient dysphoria¹.

Keloids are painful, itchy scars that can be caused by surgery. Keloids can be difficult to treat: surgical monotherapy is associated with a recurrence rate of 45–100%². Because the anterior chest is particularly prone to keloids, surgeons should aim to avoid keloid pathogenesis when conducting surgical procedures on the anterior

chest.

Here, we present a case of keloid development after mastectomy for a trans man who had good outcomes after combination treatment with keloid resection, postoperative radiotherapy, and careful wound/scar management.

Case Presentation

A 40-year-old Japanese trans man sought treatment at our institution after mastectomy with an inverted-T procedure. The procedure was performed in the Philippines because transgender persons are not widely acknowledged in Japan and few hospitals perform gender-

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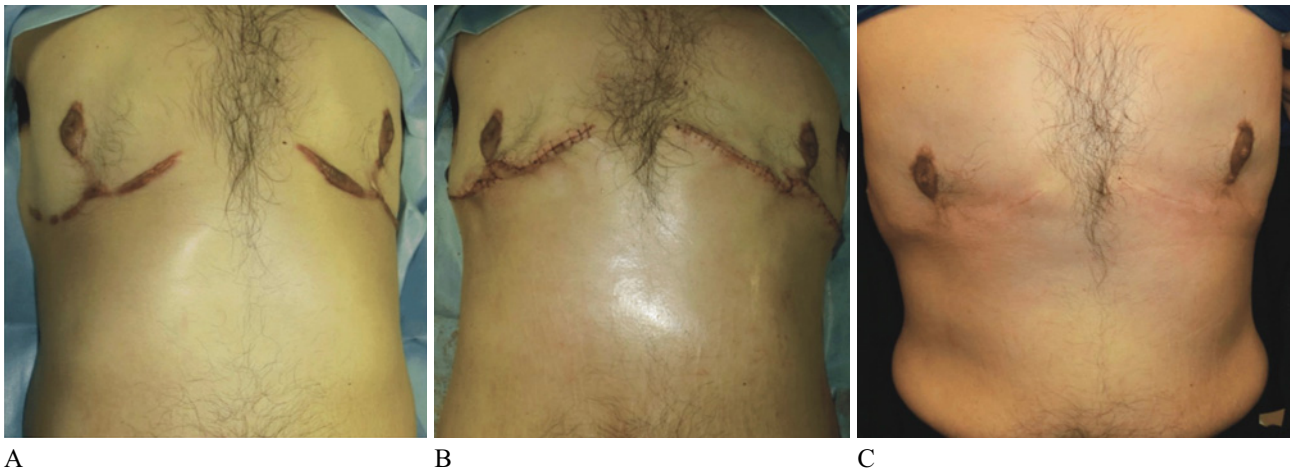


Figure 1 Photographs of a trans man patient who developed keloids on inverted-T mastectomy scars that were treated with combination therapy comprising total keloid excision, Z-plasty, layered suturing, postoperative radiotherapy, long-term taping fixation, and close follow-up

(A) View of the post-mastectomy keloids before scar revision surgery. (B) Intraoperative view after suturing. (C) Eighteen months after scar revision surgery.

affirming surgery. Consequently, many patients undergo such surgery in other countries. The patient had painful, itchy, and tender skin tumors in the T-shaped scars. The scars around the areolas exhibited mild hypertrophic growth (**Figure 1A**). Scar growth started soon after the mastectomy.

The T-scar lesions were diagnosed clinically as keloids and were completely excised with Z-plasty. The resulting skin defects were closed primarily via a layered technique: the deep fascia was sutured with 2-0 PDS Plus, the dermis with 4-0 PDS Plus, and the epidermis with 6-0 polypropylene. The hypertrophic areolar scars were not resected. The wounds and areolar scars were treated with 18 Gy/3 fractions/3 days radiotherapy on consecutive days beginning on the day after surgery (**Figure 1B**). Taping was applied daily for 1 year. Histology confirmed the keloid diagnosis. Over the next 18 months, there were no complications or recurrence and the hypertrophic areolar scars subsided. The patient was satisfied with the outcome (**Figure 1C**). Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Discussion

Keloid pathogenesis from mastectomy scars has been occasionally reported and may become more common because the prevalence of mastectomy is increasing. The risk of keloid formation is higher in Asian and Black persons^{1,3}. This is consistent with our patient, who was of Asian descent. Thus, gender-affirming surgeons should

have a good understanding of keloid etiopathology.

The key feature of keloids is chronic inflammation, which keeps scar fibroblasts in an extracellular matrix-overproducing state, thus causing scar growth^{4,5}. Chronic inflammation is driven by genetic (e.g., ethnic/familial), systemic, and local mechanical factors. The latter include skin stretching, as the anterior chest experiences strong lateral skin tension and is thus prone to keloid formation after surgery. This may also partly explain why younger age is an important systemic risk factor for keloidogenesis^{6,7}: older adults have slacker, less tense skin that absorbs skin tension.

Because surgery induces inflammation, simply resecting keloids is associated with high recurrence rates. Consequently, keloids have long been seen as intractable. However, our long experience with treating pathological scars shows that the risk of keloid formation after chest surgery or recurrence after surgical resection can be mitigated by combining multiple approaches.

The first approach is to select a surgical (in this case, mastectomy) technique that reduces the risk of keloid formation. Gender-affirming mastectomy can be conducted with any of four procedures⁸ (**Figure 2**), the choice of which generally depends on breast size, skin-excess and ptosis grades, skin elasticity, and nipple-areola complex (NAC) size/position^{9,10}. The most common procedure in Europe/United States is breast amputation, whereas 90% of Asian patients undergo the Webster technique^{8,11}. Breast amputation, which involves free NAC grafting, is selected for large ptotic breasts with inelastic

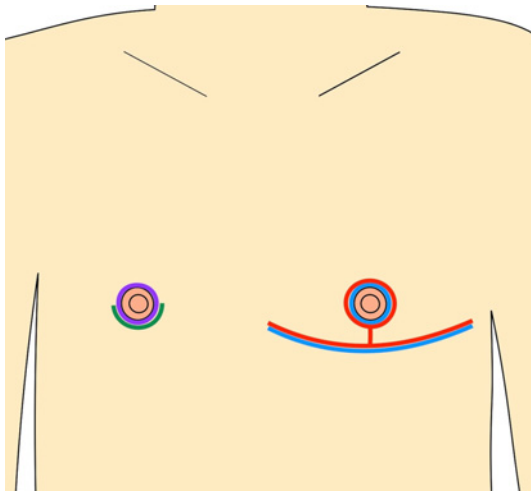


Figure 2 Gender-reassignment mastectomy procedures

Four approaches are commonly used: Webster semi-circular (green line under the right areola), concentric circular (purple line around the right areola), inverted-T (red lines on the left breast show the T incisions), and breast amputation with free nipple grafting (blue lines on the left breast).

skin, while the Webster technique is indicated for small non-ptotic breasts with elastic skin. The region-specific prevalence of these procedures reflects the predominant breast features of the respective populations. The other mastectomy procedures are the concentric-circular technique, which is used for medium-sized ptotic breasts with moderate-poor skin elasticity, and the inverted-T procedure, which is selected for large, mildly ptotic breasts with inelastic skin. The latter allows NAC resizing/repositioning without grafting and was used for our patient. Because breast amputation and the inverted-T procedure leave long lateral scars, they have the greatest risk of keloid formation. Thus, surgeons should carefully consider this risk when selecting a mastectomy procedure, especially if the patient is young, of African or Asian descent, or has a personal or family history of keloids.

The second approach is to use surgical techniques that can reduce the risk of keloid recurrence on the chest. Z-plasty or W-plasty can disrupt the lateral tension on inverted-T or amputated breast scars. Moreover, since keloids only develop when the dermal reticulum becomes inflamed, mechanical tension on this layer must be avoided during suturing. This can be achieved by placing tight sutures in the fasciae: this approximates the dermal-wound edges and allows the dermal layer to be closed under minimal tension.

The third approach is to use radiotherapy after keloid excision. This can greatly reduce the risk of keloid formation and recurrence because it suppresses aberrant endothelial cell activity, including blood vessel hyperpermeability. Such activity is chronically elevated in the keloids of patients with keloid risk factors and is thought to directly induce keloid inflammation. In our institution, we use a dose of 10–20 Gy to anterior chest wounds after keloid excision. The therapy is initiated 1–2 days after surgery and the dose is divided over 2–4 consecutive days^{7,12}. It should be noted that combining keloid resection surgery with postoperative radiotherapy has reduced keloid recurrence rates in our institution to less than 10%. Thus, we propose that chest surgery in at-risk patients should be followed by radiotherapy on an individualized basis. Notably, radiotherapy is safe for trans men because they have already had a mastectomy and thus have a minimal risk of radiation-induced breast cancer¹³.

Trans men generally receive concomitant testosterone therapy. Because it is unclear if female or male sex hormones are associated with keloidogenesis⁷, further research that clarifies these associations is warranted.

The fourth approach is to employ appropriate postoperative care, which can help reduce keloid formation and recurrence. This includes prolonged taping and moisturizer use, which limit the tension on the wound/scar and prevent friction-induced abrasion, respectively. Thorough postoperative care is also vital in detecting the earliest signs of keloid (induration/elevation). Once observed, fixation tape should be replaced with Deprodone Propionate tape (steroid tape), and the patient should be referred to a plastic surgery department⁵.

Conclusion

Gender-affirming mastectomy significantly improves quality of life for transgender men. However, the potential for chest keloid formation should be carefully considered when planning treatment and postoperative care, particularly for patients who are young, are of African or Asian descent, or have a personal or family history of keloids.

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References

1. Ammari T, Sluiter EC, Gast K, Kuzon WM Jr. Female-to-male gender-affirming chest reconstruction surgery. *Aesthet Surg J*. 2019 Jan 17;39(2):150–63. doi: 10.1093/asj/sjy098
2. Ogawa R. The most current algorithms for the treatment and prevention of hypertrophic scars and keloids: A 2020 update of the algorithms published 10 years ago. *Plast Reconstr Surg*. 2022 Jan 1;149(1):79e–94e. doi: 10.1097/PRS.00000000000008667
3. Ogawa R, Akita S, Akaishi S, et al. Diagnosis and treatment of keloids and hypertrophic scars-Japan Scar Workshop Consensus Document 2018. *Burns Trauma*. 2019 Dec 27;7:39. doi: 10.1186/s41038-019-0175-y.eCollection 2019
4. Tosa M, Ansai SI, Ogawa R. Secondary cutaneous ossification in keloids of the lower abdomen: A report of two cases. *J Nippon Med Sch*. 2022 Nov 9;89(5):546–9. doi: 10.1272/jnms.JNMS.2022_89-502
5. Dohi T, Cho H, Kamegai M, et al. Combination therapy for a severe axillary keloid with abscesses: A case report. *J Nippon Med Sch*. 2023 Feb 1;89(6):645–8. doi: 10.1272/jnms.JNMS.2022_89-610
6. Ogawa R, Akaishi S, Kuribayashi S, Miyashita T. Keloids and hypertrophic scars can now be cured completely: Recent progress in our understanding of the pathogenesis of keloids and hypertrophic scars and the most promising current therapeutic strategy. *J Nippon Med Sch*. 2016;83(2):46–53. doi: 10.1272/jnms.83.46
7. Noishiki C, Hayasaka Y, Ogawa R. Sex differences in keloidogenesis: An analysis of 1659 keloid patients in Japan. *Dermatol Ther (Heidelb)*. 2019 Dec;9(4):747–54. doi: 10.1007/s13555-019-00327-0
8. Monstrey S, Selvaggi G, Ceulemans P, et al. Chest-wall contouring surgery in female-to-male transsexuals: A new algorithm. *Plast Reconstr Surg*. 2008 Mar;121(3):849–59. doi: 10.1097/01.prs.0000299921.15447.b2
9. Cuccolo NG, Kang CO, Boskey ER, et al. Masculinizing chest reconstructive on transgender and nonbinary individuals: An analysis of epidemiology, surgical technique, and postoperative outcome. *Aesthetic Plast Surg*. 2019 Dec;43(6):1575–85. doi: 10.1007/s00266-019-01479-2
10. Kaariainen M, Salonen K, Helminen M, Karhunen-Enckell U. Chest-wall contouring surgery in female-to-male transgender patients: A one-center retrospective analysis of applied surgical techniques and results. *Scand J Surg*. 2017 Mar;106(1):74–9. doi: 10.1177/1457496916645964
11. Namba Y, Watanabe T, Kimata Y. Mastectomy in female-to-male transsexuals. *Acta Med Okayama*. 2009 Oct;63(5):243–7. doi: 10.18926/AMO/31841
12. Ogawa R, Dohi T, Tosa M, Aoki M, Akaishi S. The latest strategy for keloid and hypertrophic scar prevention and treatment: the Nippon Medical School (NMS) protocol. *J Nippon Med Sch*. 2021 Mar 11;88(1):2–9. doi: 10.1272/jnms.JNMS.2021_88-106
13. de Blok CJM, Wiepjes CM, Nota NM, et al. Breast cancer risk in transgender people receiving hormone treatment: Nationwide cohort study in the Netherlands. *BMJ*. 2019 May 14;365:l1652. doi: 10.1136/bmj.l1652