Annals of Case Reports
Alvarado JL, et al. Ann Case Rep: 8: 1131
www.doi.org/10.29011/2574-7754.101131
www.gavinpublishers.com

OPEN ACCESS

GAVIN PUBLISHERS

Research Article

First Microvascular Gracilis Flap for Breast Reconstruction at the Military Specialty Hospital for Women and Neonatology

Jose Luis Alvarado[1], Salvador De La Fuente Sedano[2], Pablo Alberto Gutiérrez Vega[3], Rafael Briceño Hernández[4], Julio Orlando Rodriguez Bautista[5], Silva Minutti Maria Paola[6], Viurcos Victoria Scarlett[7*], Erik Alejandro Torre Anaya[8], Rodrigo Banegas Ruiz[9]

[1]Private Practice at Hospital Angeles Lomas, microsurgery, Mexico

[2]Private Practice at Hospital Angeles Lomas, plastic surgery, Mexico

[3]Physician with Private Practice Associate Physician of the Spanish Hospital, Gynaecologist Oncologist, Mexico

[4]Attached to the Military Hospital for Women's Specialties and Neonatology, Gynaecologist Oncologist, Mexico

[5]R3 of plastic surgery in Central Military Hospital, Mexico

[6]RI of General Surgery in Hospital Rubén Leñero Hospital, Mexico

[7]R2 of General Surgery in Hospital ISEM General de Atizapán "Dr. Salvador González Herrejón", Mexico

[8]Private Practice Physician and Researcher, Mexico

[9]Physician Attached to the Plastic and Reconstructive Surgery Service at the National Rehabilitation Institute, hand surgery, Mexico

***Corresponding author(s)**: Viurcos Victoria Scarlett, R2 of General Surgery in Hospital ISEM General de Atizapán "Dr. Salvador González Herrejón", Mexico

Erik Alejandro Torre Anaya, Private Practice Physician and Researcher, Mexico

Citation: Alvarado JL, Sedano SDLF, Vega PAG, Hernandez RB, Bautista JOR, et al (2023) First Microvascular Gracilis Flap for Breast Reconstruction at the Military Specialty Hospital for Women and Neonatology. Ann Case Report. 8: 1131. DOI:10.29011/2574-7754.101131

Received: 13 January 2023, **Accepted:** 17 January 2023, **Published:** 19 January 2023

Abstract

In post-mastectomy breast reconstruction, different types of flaps have been described, being the gold standard the abdominal autologous tissue with microsurgical technique; but sometimes this is not the one of choice, taking into account the characteristics of the native breast shape and the proportion with the thorax, so it is described the gracilis muscle flap with cutaneous island, which by its anatomy, as well as the volume it generates, usually gives a favourable aesthetic results, especially taking into account patients with slender morphology and / or athletic. In the case we present, breast reconstruction was performed with gracilis flap and subsequent reconstruction of the per areolar area and neo formation of the nipple areola complex (CAP) with skate flap and tattooing for pigmentation, with adequate aesthetic results.

Keywords: Gracilis muscle flap; Microsurgery; Breast reconstruction

Introduction

Currently the gold standard for breast reconstruction is the abdominal autologous tissue with microsurgical technique [1], a common challenge in the daily practice of the plastic surgeon, but in case of contraindications to use an abdominal flap or if the patient does not want surgery in this area or is not a candidate for this procedure, there is an arsenal of possibilities for reconstruction, which forces to question what is the best option and increase the arsenal of flaps. Among the options available for breast reconstruction is the transverse my cutaneous gracilis muscle flap, curiously celebrating its 30th anniversary, described by Yousif et al. In 1991, presenting multiple modifications in the last 30 years [2] and the possibility to transfer lymph nodes for lymphedema treatment. This is a versatile flap that historically offers us a first choice for functional reconstruction due to its single motor nerve, the anterior obturator branch (L2-L4), with a type II vascular pattern in the Mathes and Nahai classification, a dominant vascular pedicle located approximately 8 cm from its insertion on the inferior branch of the symphysis pubis, in most cases 2 minor pedicles, coming from the superficial and deep femoral, respectively, with a muscular or cutaneous muscle component, which can vary in size, making it a flap with a relatively constant anatomy, which facilitates its harvesting and dissection, decreasing surgical time and the risk of complications, compared to the abdominal autologous tissue [3]. The transverse musculocutaneous gracilis flap is the workhorse for breast reconstruction, indicated when we are faced with a contralateral breast of smaller volume, in case of contraindications to use a deep inferior epigastric perforator flap (DIEP) or a transverse abdominal my cutaneous flap (TRAM), if we have failed flaps, we can use it as a rescue flap or simply by the same choice of the patient [4]. In our experience we can affirm that besides offering us a very good option for breast reconstruction, due to all the advantages it has, it gives us a safe reconstructive possibility, because once the flap is made we have a result with low risk of complications; aesthetically satisfactory for the patient, and once the nipple-areola complex is reconstructed, the final result is similar to the contralateral breast.

Case Presentation

36-year-old female with a history of smoking for more than 15 years, right breast cancer (carcinoma in situ) during pregnancy, operated for modified radical mastectomy and node resection. She was sent to our service after referral for reconstructive treatment. At the initial physical examination she presented sequelae of right mastectomy with horizontal scar of approximately 10 cm and absence of ipsilateral mammary gland, left breast with an approximate volume of 290 cc HCAP 22 cm CAP 6 cm (Figure 1); she was scheduled for breast reconstruction with gracilis free flap; After 6 months contralateral breast symmetrisation is performed with per areolar mastopexy and neo formation of CAP (Figure 2), with skate flap technique and later, tattooing to match pigments of the CAP (Figure 3); currently the patient is satisfied with the result of the total breast reconstruction (Figure 4).

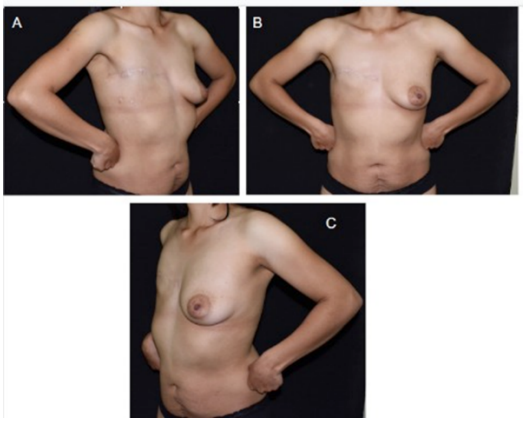

Figure 1: Post mastectomy images, prior to reconstruction with gracilis muscle flap.

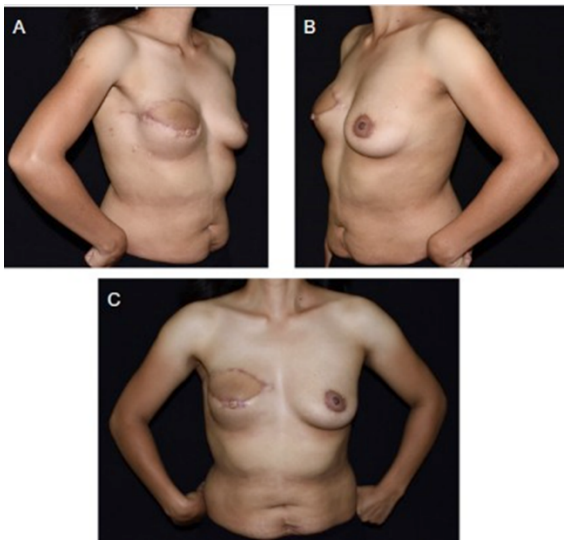

Figure 2: Result after reconstruction of the CAP.

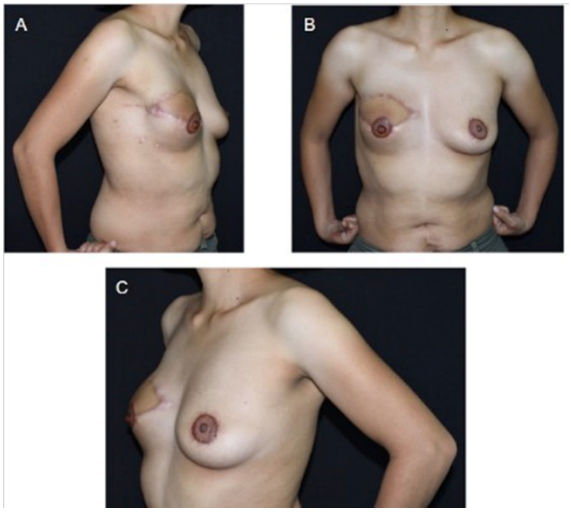

Figure 3: Final result after nipple and areola tattooing.

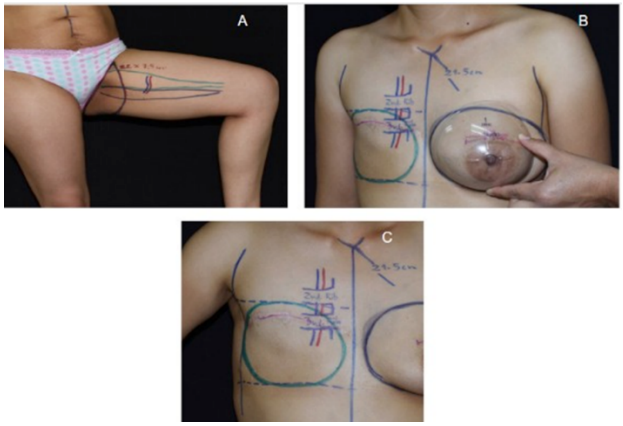

Figure 4: Surgical marking and planning of the reconstruction using the gracilis muscle flap.

Surgical Technique

The patient is marked with the hip in flexion and adduction, identifying the adductor Magnus muscle, a line is marked from the inferior branch of the symphysis pubis, to the medial condyle of the tibia, the gracilis muscle is drawn medial to this line from its origin and insertion. Approximately 8 cm from the symphysis pubis on the previously marked line, locating the main pedicle. As for the marking of the cutaneous island, this is performed transversally starting in the groin having as anterior limit a point marked 5 cm from the origin of the gracilis muscle, then a point marked in the medial line of the posterior thigh, considering the width by means of the "pinch test", to ensure primary closure, being approximately 8 cm, marking the second and third intercostal space on the thorax, where the mammary vessels are located [1]. An anterior and posterior incision is made on the cutaneous island up to the adductor Magnus muscle fascia, freeing the perforators of this muscle, proceeding to perform a posterior dissection of the gracilis muscle, once the edges of the muscle are identified, taking the dissection in a caudal direction so that by means of a transverse incision in the medial thigh of approximately 3 cm, its insertion tendon is released in the distal third, traction of the adductor Magnus is performed to identify the nerve, Once this maneuver is done, the internal mammary receptor vessels are dissected, the vascular pedicle is freed with its concomitant veins, after making the flap in the form of a mammary pocket using the cutaneous island and the muscle, the arterial and venous anastomosis of the aforementioned vessels is performed with microsurgical technique with 9-0 separate sutures, fixing the flap and suturing it to the skin [5,6].

Discussion

The modified Gracilis muscle flap with transverse skin island is a good option for breast reconstruction compared to the gold standard (abdominal tissue as a free flap or a pedicled flap), since its average volume 385. 7 g, having 3 angiosomes, makes it a favourable option [2,4,7,8]; which coincides with the literature since it has been concluded that this is a flap with few variations described, Natoli et al for example in their study of 36 gracilis flaps concluded the low anatomical variability [9], only in 17% of cases, being the main 11% double main pedicle, and 5% a single double pedicle [10]. Peck, Muller et al. described in a series of 43 cases the anatomical characteristics of the gracilis flap, of the perforators they found an average of 5 perforators per thigh, 72% musculocutaneous, 28% sept cutaneous [11]. With anatomical evidence of being a flap that maintains constant anatomical characteristics, facilitating the surgical technique of harvesting and transfer, being a great option for multiple defects in reconstruction, in particular, by the modification of the cutaneous island in a transverse sense, facilitates the preparation of an autologous breast implant, Weitgasser et al. carried out a study on 300 flaps describing an average skin island size of 31 cm (range 25-36 cm) [12], with an average volume of 320g, which guarantees a sufficient volume in case a low volume reconstruction is required. Regarding the recipient site, the technical requirement comes in the dissection of the recipient pedicle Hyungsuk Kim et al. performed a tomographic anatomical study in 71 breast reconstruction patients, describing the characteristics of the recipient site, finding a mean length of the right second intercostal space of 3. 3 mm, left 3.1 mm, right third intercostal space 3.1 mm, left 3.3 mm, with a diameter of the right internal mammary artery of 1.74 mm x 0.30 mm, left 1.76 mm x 0.31 mm, with a decrease in diameter to the third space of 0.04 mm approximately [13], facilitating the anastomosis with the diameters of the main pedicle of the gracilis flap. Regarding complications, Weitgasser et al. in a series of 300 patients who underwent breast reconstruction with gracilis muscle flap, described the main complications, seroma in 14%, loss of the flap 6.3%, cellulitis 5%, as for donor site complications, in a series

of 49 flaps by Craggs et al. presented 59%, with wound dehiscence as the main one ($p < 0.001$) [14].

Conclusions

The gracilis free flap is a good option for breast reconstruction in those thin patients, who present previous abdominal surgeries or do not wish to have scars in that anatomical area, being a flap with a low rate of complications described, a constant anatomy, and a flap of easy dissection in experienced surgeons, we can consider it the one of secondary choice, Likewise, in this case the complete reconstruction was performed (CAP neo formation and per areolar mastopexy) forming a symmetrisation of both breasts, completing the total reconstruction of the breast, understanding that this reconstructive process will take months, and sometimes years, in most cases will represent multiple surgical procedures.

References

1. Wechselberger G, Traintinger H, Larcher L, Russe E, Edelbauer M, et al (2016) Clinical applications of the transverse musculocutaneous gracilis flap for secondary breast reconstruction after simple mastectomy. Plast reconstr surg. 137:19-28.
2. Yousif NJ, Matloub HS, Kolachalam R, Grunert BK, Sanger JR (1992) The transverse gracilis musculocutaneous flap. Ann plast surg. 29: 482-490.
3. Fansa H, Schirmer S, Warnecke Ic, Cervelli A, Frerichs O (2008) The transverse myocutaneous gracilis muscle flap: a fast and reliable method for breast reconstruction. Plast reconstr surg. 122: 1326-1333.
4. Schoeller T, Huemer Gm, Wechselberger G (2008) The transverse musculocutaneous gracilis flap for breast reconstruction: guidelines for flap and patient selection. Plast reconstr surg. 122: 29-38.
5. Buntic RF, Horton KM, Brooks D, Althubaiti GA (2011) Transverse upper gracilis flap as an alternative to abdominal tissue breast reconstruction: technique and modifications. Plast reconstr surg.128: 607e-613e.
6. Huemer Gm, Puelzl P, Schoeller T (2012) Breast and chest wall reconstruction with the transverse musculocutaneous gracilis flap in poland syndrome. Plast reconstr surg. 130: 779-783.
7. Saint-Cyr M, Wong C, Oni G, Maia M, Trussler A, et al (2006) Modificaciones para extender el colgajo transverso del gracilis superior en reconstrucción mamaria: series clínicas y resultados. Plast reconstr surg. 129: 24e-36e.
8. Pan WR, Taylor GI (2009) Los angiosomas del muslo y la nalga. Plast reconstr surg. 123: 236-249.
9. Wong C, Mojallal A, Bailey SH, Trussler A, Saint-Cyr M (2011) The extended transverse musculocutaneous gracilis flap: vascular anatomy and clinical implications. Ann Plast Surg. 67: 170-177.
10. Natoli NB, Wu LC (2015) Variaciones vasculares del colgajo gracilis superior transverso en consideración para la reconstrucción mamaria. Ann plast surg. 74: 528-531.
11. Peek A, Müller M, Ackermann G, Exner K, Baumeister S (2009) The free gracilis perforator flap: anatomical study and clinical refinements of a new perforator flap. Plast reconstr surg. 123: 578-588.
12. Weitgasser L, Mahrhofer M, Schwaiger K, Bachleitner K, Russe E, et al (2021) Lessons learned from 30 years of transverse myocutaneous gracilis flap breast reconstruction: historical appraisal and review of the present literature and 300 cases. J clin med.10: 3629.
13. Kim H, Lim SY, Pyon JK, Bang SI, Oh KS, Mun GH (2012) Preoperative computed tomographic angiography of both donor and recipient sites for microsurgical breast reconstruction. Plast reconstr surg. 130: 11e-20e.
14. Craggs B, Vanmierlo B, Zeltzer A, Buyl R, Haentjens P, et al (2014) Donor-site morbidity following harvest of the transverse myocutaneous gracilis flap for breast reconstruction. Plast reconstr surg. 134: 682e-691e.