European Journal of Plastic Surgery (2019) 42:85–90
https://doi.org/10.1007/s00238-018-1458-4

IDEAS AND INNOVATIONS

Inverted nipples correction with glandular retropapillar flap: demonstration of a technique

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Received: 14 February 2018 / Accepted: 21 August 2018 / Published online: 4 September 2018

Abstract

Inverted nipples constitutes functional and esthetic problems, generating frustration in women regarding breastfeeding and reduced self-esteem and self-efficacy in appearance. Many techniques for surgical correction have already been described. Most use dermal patches of the areola alone or associated with sutures that fit in the base of the papilla. Description of technique for correction of inverted nipple through a series of bilateral or unilateral cases. The surgery presents adequate projection of the nipple, sensitivity and functionality is preserved, and satisfaction with the postoperative result. This study demonstrates an easily reproduced technique that spares local tissue, using a small incision and mobilizes sufficient volume to project the papilla, without deforming the areola.

Level of Evidence: Level IV, therapeutic study

Keywords Inverted nipples · Breast surgery · Invaginated nipples · Umbilicated nipples

Introduction

The inverted nipple has been recognized since 1840 when quoted by Sir Ashley Cooper [1]. It was initially classified by Schwager [2] as "umbellic" (inverted intermittently) and "invaginated" (inverted permanently). Recently, Han and Hong [3] divided the inverted nipple into three grades based on their severity: grade I (papilla easily projected by manual maneuver and maintaining its projection), grade II (projected by manual maneuver but does not maintain projection), and grade III (difficult to project manually). The prevalence is higher in women [4] and incidence in the USA ranges from 2 to 10% [2, 5, 6]. The etiology is divided into congenital [7] and acquired, this being due to mastitis, breast cancer, hypertrophy, and breast surgeries [2].The appearance of the nipple influences activities and clothing and can also provoke feelings of inadequacy in the development of women, generating psychological problems regarding sexual life and motherhood [8].

The principles guiding the technique should be based on the finding that inverted nipple have less connective tissue than normal ones [2]. Since the first description of this deformity, several techniques have been proposed and it is agreed the need to add tissue volume to increase the vertical projection of the papilla, as well as the intention to preserve the lactating ducts, although this is not always possible.

Objective

Demonstrate a technique recommended by the Department of Plastic Surgery of Faculdade de Medicina de Marília (FAMEMA), São Paulo, Brazil.

Method

A descriptive analytical study based on a series of cases where inverted nipple were surgically corrected, which technique uses the retropapillary glandular flap for projection of the papilla. Included in the study were women aged 16 to 65 years who presented nipple inversion in any degree—using Han and Hong's classification as follows: grade I (mild), grade II (moderate), and grade III (severe)—and followed up for 5 years in

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our department. The patients who did not follow up or with incomplete data in the medical records were excluded. This totalled 12 patients in the study.

Eight presented with unilateral inverted nipple and four with bilateral. The principles of the revised Declaration of Helsinki [9] were respected, as well as Resolution 466/12 of the Brazilian National Health Council [10] and the study approved by Ethics Committee of Faculdade de Medicina de Marília (FAMEMA). Informed consent was obtained from all individual participants included in the study.

Surgeries for the correction of inverted nipple were performed under local anesthesia and sedation, in a surgical center. Exceptionally, when associated with other surgeries, such as the inclusion of silicone breast implants, mastopexy, and even in reducing mammoplasties, they were performed under general anesthesia.

The technique consists of an infrapapillary semicircular incision, involving 60% of the papillary circumference, on the marking performed at the transition between the papilla and the areola, the papilla being effectively and vertically tractioned by a simple Gillies hook or by transfixing suture of the nipple with nylon or Polypropylene 2.0 attached to Kelly tweezers. With a no.11 scalpel blade, an "inverted cone" is incised under the nipple, about 2- to 3-cm deep, keeping the most part of the ducts of the papilla intact (duct preserving method), making a glandular flap (Fig. 1). We release, with the same blade, any fibrotic bands that may be pulling the papilla.

Rigorous hemostasis is done. The resulting dead space is sutured from the depth to the surface, with absorbable Polyglecaprone 3.0, so the obtained flap migrates anteriorly raising the papilla. Simple suture of the skin with Nylon or Polypropylene 6.0 is use. The bandage is made by interposing gauze, with an orifice cut in the center, and transparent plastic device (tip of a 10-ml syringe) which the nipple is anchored by nylon 3.0, allowing perfusion monitoring (Fig. 2).

The satisfaction after the procedure was measured subjectively (satisfied or not with the projection) avoiding bias of the difference of age and the size of the breasts. Lactation was considered normal/effective in patients capable of breastfeeding without drug stimulation with absence of mastitis and milk retention. Sensitivity of the nipple was tested using the test (hot-cold) with gauze soaked with 70% alcohol and another dry.

Results

After the selection of the patients with complete data, four of them were presented with grade I of Han and Hong's classification, six with grade II, and three with grade III (severe) in the preoperative period. The sensitivity was tested preoperatively with the hot-cold test (explained in the method session). Lactation was measured only by the fact that it was able to perform it. The amount of milk or difficulty in suctioning of the child has not been verified.

Using this technique, adequate projection of the nipple, preservation of the sensitivity, and satisfaction (using the parameters described in the method session) were observed in all 12 patients. Eight of the patients breastfed after surgery (five with unilateral and three with bilateral inverted nipple). The other four patients did not have pregnancy during these 5 years of follow-up. Complications such as hematoma and wound infection were not observed. The patients have been under follow-up for 5 years not presenting recurrence of inverted nipple (Figs. 3, 4, and 5).

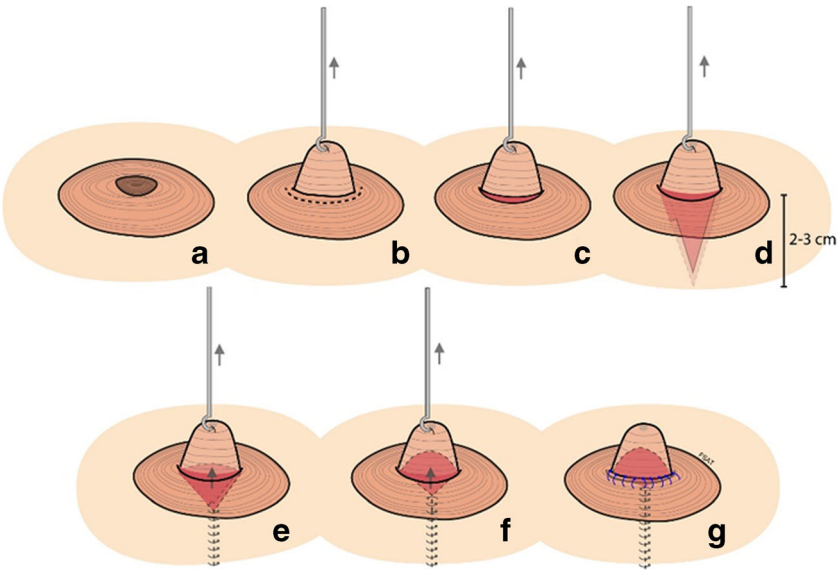

Fig. 1 Picture demonstrating the technique described. (A) Inverted nipple. In (B), the papilla is drawn anteriorly with the aid of a Gillies hook and the dotted lines correspond to the infrapapillary incision, which is represented in (C). In (D), incision in inverted cone, with 2 to 3 cm of depth, that is, sutured in (E) and (F). In (G), final result, with projected papilla

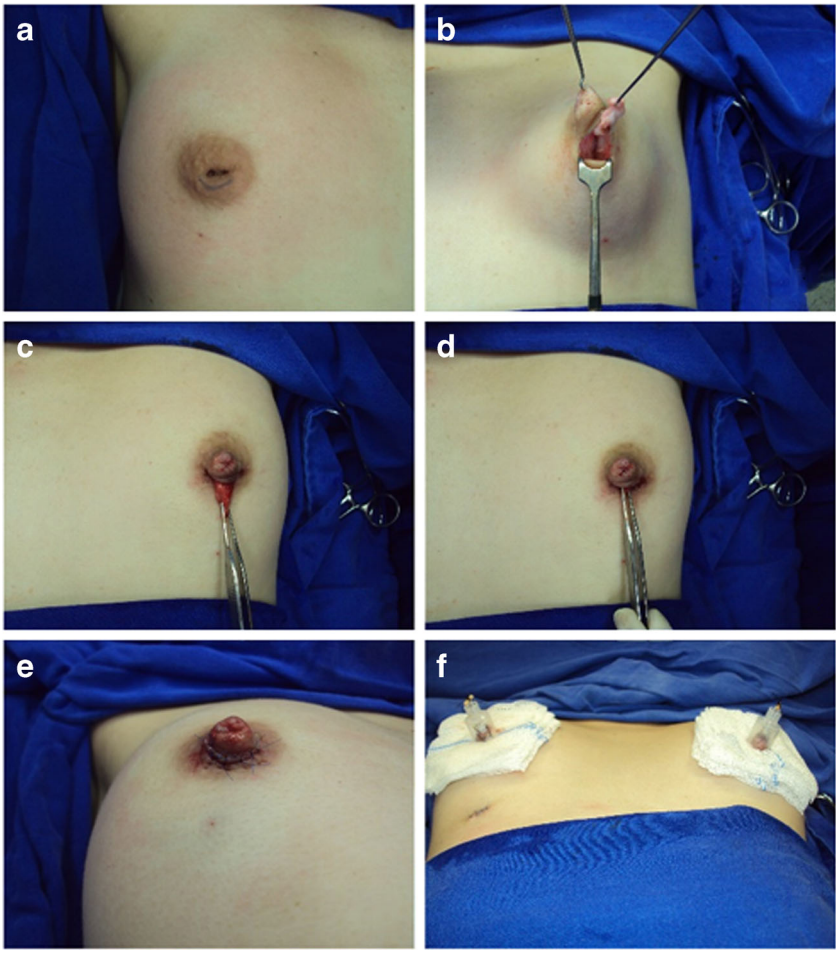

Fig. 2 Thirty-year-old patient during intraoperative correction of grade II inverted nipple bilaterally. **a** Infrapapillary semicircle marking, right breast. **b** High glandular patch, showing dead space to be sutured, left breast. **c** Detail of the glandular flap, left breast. **d** Retroposed glandular remnant retropapillary, left breast. **e** Skin suture, right lower breast view. **f** Bandages with gauzes and tip of syringes for anchorage of the operated nipple

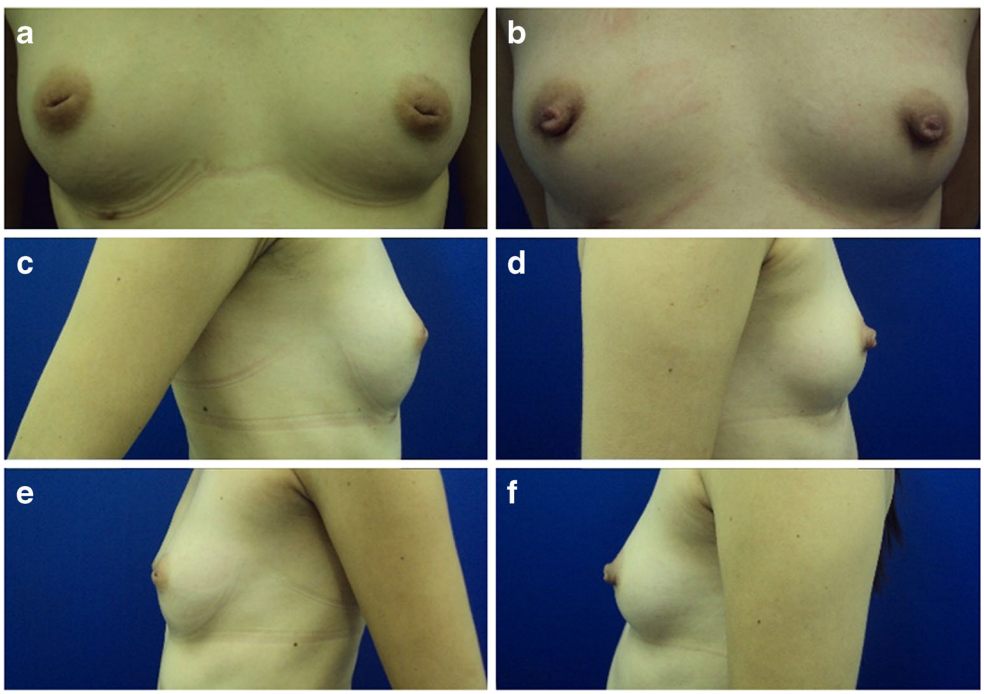

Fig. 3 Preoperative comparison with the result of the thirty-two postoperative day of a 30-year-old patient with bilateral grade II inverted nipple. **a** Front view, preoperative. **b** Front view, postoperative. **c** Right lateral view, preoperative. **d** Right side view, postoperative. **e** Left lateral view, preoperative. **f** Left lateral view, postoperative

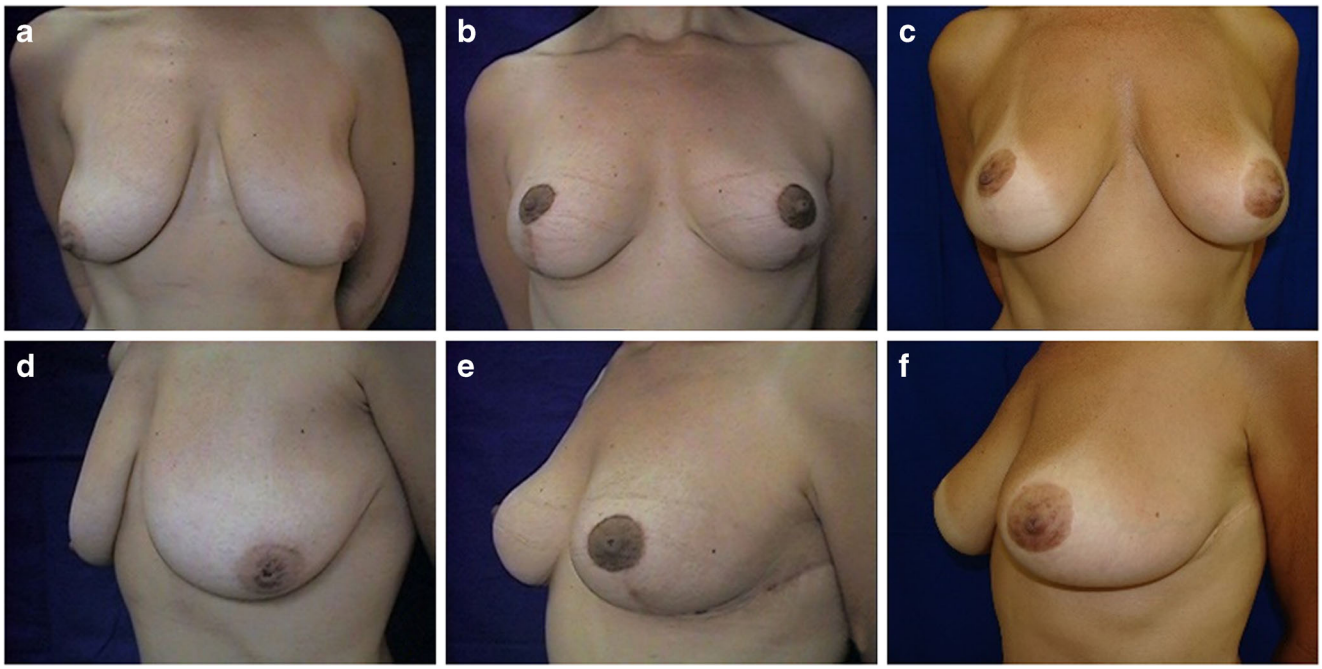

Fig. 4 Thirty-three-year-old patient with left inverted nipple associated with mammary ptosis, preoperative comparison and postoperative results. **a** Front view, preoperative. **b** Frontal view, 6 months after surgery. **c** Frontal view, 5 years after surgery. **d** Left oblique view, preoperative. **e** Left oblique view, 6 months after surgery. **f** Left oblique view, 5 years after surgery

Discussion

For over a century, the inverted nipple has been thematic and the subject of investigation in several studies. An inverted nipple results from the failure of the underlying mesenchyme to proliferate and elevate it from its retracted position during breast development. In their studies, Schwager [2] demonstrated that there is no qualitative histological difference in the sub areolar tissue; however, the thickness of the connective dense tissue under the normal papilla is twice as large as in the congenital inverted papilla. Cited by Teimourian [4] and more recently, histologically demonstrated by Han and Hong [3], differences in the composition of the inverted papilla imply clinical severity. The shorter and atrophic are the lactiferous ducts with significant fibrosis and less connective tissue, the more inverted the nipple. These findings are currently accepted and are the basis for adequate surgical correction.

Techniques described in the literature have one or more of the following maneuvers: narrowing of the base, addition of volume under the papilla, and preservation or section of the lactiferous ducts. Kehrer [11] was the first to describe a surgery involving the excision of two semi circles of the areola skin to narrow the base of the papilla. Basch [12] added the concept of circular myotomy of the areola and Sellheim [13] combined the two procedures. Axford [14] was the first to describe purse string, popularized by LaMont [15, 16] and Schwager [2]. Considering pouch suture could impair the blood supply to the operated nipple, new techniques have arisen to supplement tissue under the papilla, preferably dermal flaps of the areola and or gland, although tendon and atrial cartilage grafts as well as alloplastic materials have been described [17]. Elsahy [18] described the use of depolarized dermal epidermal flaps under tunnel under the papilla.

Variations of this technique serve as a basis for correction of inverted nipples to a greater degree [19], with modifications in the design of the depolymerized flaps [20]. Crestinu [8] mentions that the recanalization of the ducts is possible after a few years postoperative; however, in our technic, we preserved the most part of the ducts of the papilla, using an inferior glandular flap.

Of the total patients operated in our department, only 12 of them managed to follow up for 5 years. Many have done only one postoperative consultation or none. Most of the patients are poor patients who live in distant cities, justifying the fact that they are not able to do the correct follow-up.

Patient satisfaction is an interesting method to verify the effectiveness of the technique. Different races, ages, and breasts sizes presented specific projections of papilla, being difficult to show that a standard size of papilla or nipple is the correct one or not, being the individualization of each country the way to the success of each result. This is shown by Hernandez Yenty [21] who performed a meta-analysis showing that the literature show only recurrence or not, not having defined parameters of measurement of ideal projection or particularity. But we recognize that subjective satisfaction evaluation is a flaw.

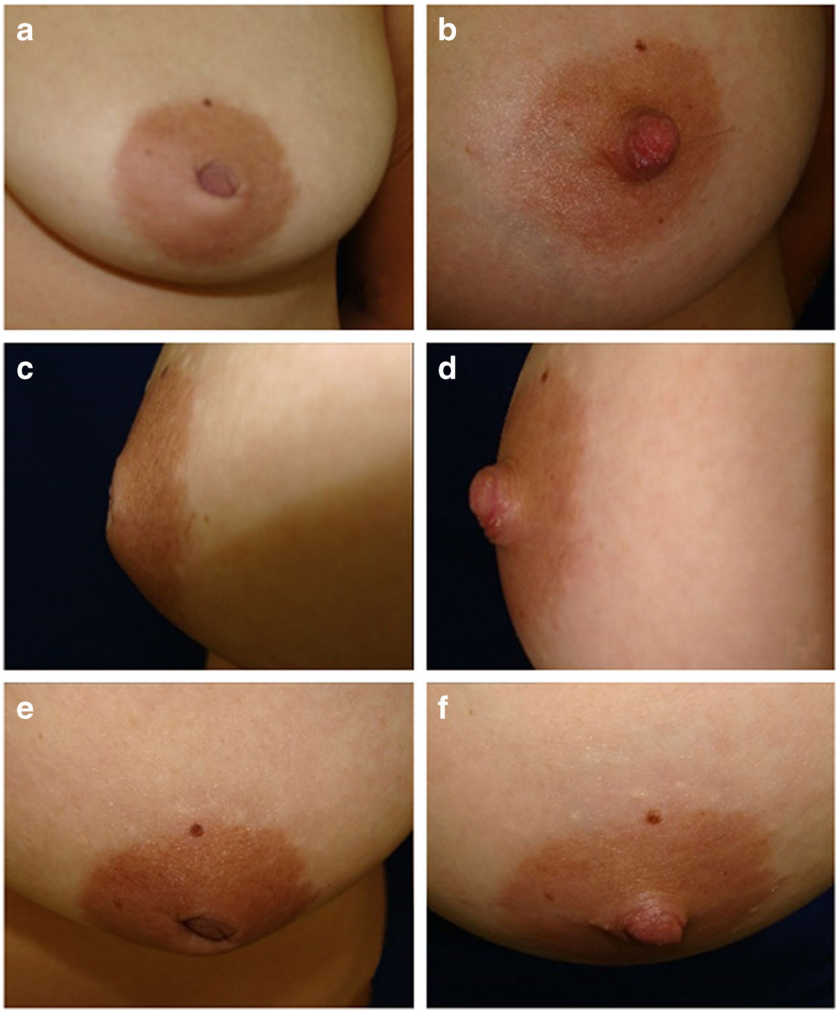

Fig. 5 Thirty-three-year-old patient with left unilateral inverted nipple associated with hypomasty, preoperative comparison and results 18 months after surgery. **a** Front view, preoperative. **b** Front view, postoperative. **c** View in profile, preoperative. **d** Profile view, postoperative. **e** Skull-caudal view, preoperative. **f** Skull-caudal view, postoperative

The technique presented in this work does not require suture in the pouch therefore, minimizing the risk of papilla suffering, separate the glandular retropapillar flap, which is used as volume supplementation for projection and there are no incisions and sutures that extrapolate the limits of the papilla on the surface. The maintenance of peripheral lactiferous ducts is possible because of their anatomy which are predominant in the upper poles of the breasts, preserving the major parts of the ducts of the papilla [20]. In cases of association with reductive mammoplasty, if the ascending nipple areola complex (NAC) is difficult or scarce retropapillary tissue, this technique is contraindicated as we cannot guarantee the efficiency of the nipple blood supply after a huge manipulation of the nipple areola complex area [19].

Conclusion

This paper describes a technique that corroborates, with relevant literature, the need to add volume to the papilla projection, as well as the release of the fibrotic bands that keep it inverted and innovate when performed through a small incision that does not exceed the limits of the papilla with satisfactory and long-lasting results. However, it is necessary to increase the number of patients operated using this technique to follow possible complications, as well as arrive at a more elaborate conclusion. The maintaining of follow-ups beyond 5 years of patients already operated is also paramount.

Acknowledgements Authors would like to thank Craig Parviz Mehjou MSc, BSc and Zayd Al-Khafaji for reviewing the manuscript.

Compliance with ethical standards

Funding The present study did not receive any funding.

Conflict of interest H. R. Paoliello Júnior, A. S Silva, F. S. Cardoso, and W. A. Campos declare that they have no conflict of interest.

Ethics approval The principles of the revised Declaration of Helsinki [9] were respected, as well as Resolution 466/12 of the Brazilian National Health Council [10] and the study approved by Ethics Committee of Faculdade de Medicina de Marília (FAMEMA), São Paulo, Brazil.

Informed consent Informed consent was obtained from all individual participants included in the study.

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