Surgical Strategies in the Correction of the Tuberous Breast

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KEYWORDS

• Tuberous breast • Congenital breast • Constricted breast • Breast asymmetry

KEY POINTS

- The tuberous breast is a congenital abnormality of breast development that incorporates a constricted base of the breast and 1 or more of the following: high inframammary fold, areola hypertrophy, pseudoherniation of tissue through the areola, ptosis, hypoplasia, and breast asymmetry.
- Advanced forms of tuberous breast are readily apparent clinically; however, the diagnosis of more minor forms of tuberous breast requires careful examination and a high index of suspicion.
- The principles of treatment of the tuberous breast include:

a. Release of the constricted base through expansion, scoring, or internal flaps.
b. Lowering of the inframammary fold and restoring a normal nipple to inframammary fold distance.
c. Correction of herniated breast tissue.
d. Reduction of the size of the areola.
e. Augmenting the breast volume, when necessary.
f. Correction of underlying breast asymmetry.

INTRODUCTION

Breast anomalies characterized by an abnormality or asymmetry of the breast base have been called many names including tuberous breasts, tubular breasts, herniated nipple areolar complex (NAC), Snoopy deformity, lower pole hypoplasia, and constricted breasts.[1–5] These terms all represent varying degrees of the same deformity, with a multitude of different techniques described for their correction. No matter the name, it is broadly characterized by a deficiency in the vertical and horizontal dimensions of the breast, frequent underdevelopment of the breast, asymmetry, and herniation of breast tissue into the areola accompanied by expansion of the areola. Since its first description in 1976 by Rees and Aston,[1] this deformity, now most commonly referred to as the tuberous breast, has been the subject of several classification systems and a host of surgical management options.

It has been said that no other condition of the breast presents the same type of surgical challenge as the tuberous breast deformity.[6] Understanding its features and implementing a methodical approach to its surgical management is paramount, as the psychological and emotional effect these deformities can have on women are significant.[7]

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Despite several large reported series, the prevalence of tuberous breast deformity is not firmly established. DeLuca-Pytell and colleagues[8] reported a prevalence of 73% in a retrospective analysis of 375 patients presenting for mammoplasty. Zambacos and Mandrekas[9] suggested that the actual percentage of tuberous breast is unknown but is actually much lower (6%–7%) than the one reported in the study by DeLuca-Pytell and colleagues.[8] Although some investigators consider this to be a problem of the female breast only,[7] several recent studies have described similar features in the male breast.[10] Asymmetry in tuberous breast deformity is almost always present[7]

A high index of suspicion is important in recognizing all forms of a tuberous breast. The unique anatomic features require specific surgical decisions and techniques in comparison with a standard breast augmentation. Failure to recognize this will predispose the patient to an unsatisfactory outcome and increase the likelihood of problems such as implant malposition, implant edge visibility and palpability, persistence of the old inframammary fold (IMF), and secondary soft-tissue deformities.

ANATOMY AND HISTOPATHOLOGY

The clinical features of the tuberous breast are illustrated in **Fig. 1**, and include a reduced breast base diameter, a high and constricted IMF, breast hypoplasia, ptosis, areola hypertrophy, herniation of tissue into the areola, and variable asymmetry of the breast.

The etiology of this deformity is unclear. Glaesmer (1930) suggested a phylogenetic relapse and Pers (1968) postulated that there is a failure of tissue differentiation in a limited zone of the fetal thorax.[3] These theories were effective in explaining deformities consistent with amastia and Poland syndrome, but more recent theories point to a simpler explanation that highlights the abnormal superficial fascia or weakness of the periareolar supporting tissues in the tuberous breast.

In earlier description and classification of tuberous breast deformity, Grolleau hypothesized in 1999 that the tuberous form is the result of stronger than normal adherence between the dermis and underlying muscle in the lower quadrants of the breast, which the developing breast cannot release. This adherence restricts peripheral expansion of the breast, causing it to develop in a forward direction and giving the breast its tubular appearance. In cases where the connective and muscular structure of the areola is weak, the gland herniates into the areola. These theories have been more recently expanded with Mandrekas' description of the ring theory[1] and Costagliola's discussion of the role of the weakened peri-NAC skin and fascia in predisposing to herniation of tissue into the areola.[6]

Together, these theories describe the breast as contained within a superficial fascial envelope, continuous with Camper fascia in the abdomen. The superficial layer covers the breast parenchyma, and the deep layer lies on the pectoralis fascia and forms the posterior boundary. A constricting ring at the level of the areola caused by a thickening of the superficial fascia, the joining of the 2 fascial layers at a higher level, or a thickening of the suspensory ligaments in this area inhibits normal development of the breasts. This constriction, combined with the absence of the superficial layer of the fascial envelope under the areola, allows for preferential development of the growing breast in a vertical direction with herniation through the weakened peri-NAC skin, resulting in the tuberous shape with areolar widening.

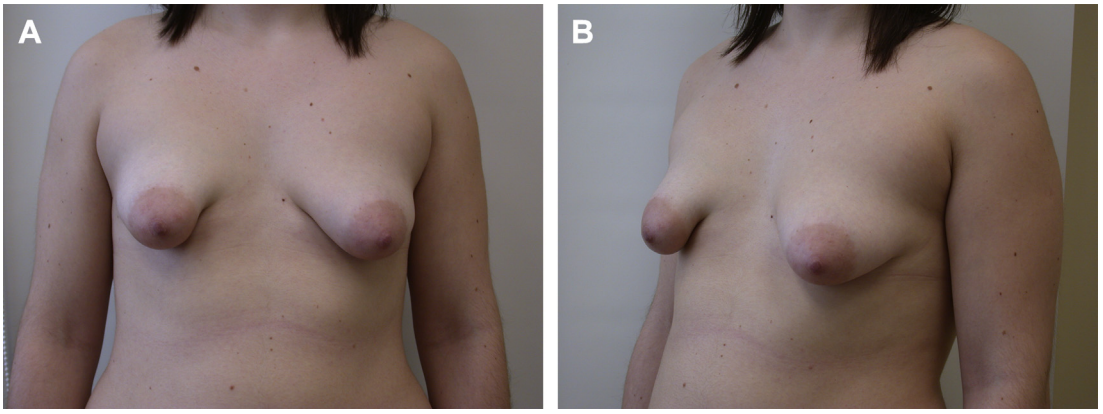

Fig. 1. (*A*, *B*) Clinical features of the tuberous breast: constricted base, high IMF, areola hypertrophy, herniation of tissue into areola, hypoplasia, asymmetry.