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An Overview on Tuberous Breast Deformity

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Abstract

To date there are many descriptive terms for the tuberous breast deformity but there is no widely accepted nomenclature. A retrospective study was undertaken of 68 tuberous breasts and the operative corrections performed. The deformities were classified into four types. Type I (hypoplasia of the lower medial quadrant), type II (hypoplasia of the lower medial and lateral quadrants, sufficient skin in the subareolar region), type III (hypoplasia of the lower medial and lateral quadrants, deficiency of skin in the subareolar region) and type IV (severe breast constriction, minimal breast base). Areolar prolapse, usually regarded as a major symptom, was only found in 30 (44%) deformed breasts. Postoperative review of 51 breasts in 31 patients showed that type I cases treated by reduction mammaplasty of adequately sized breasts or augmentation of hypoplastic breasts had excellent results. These procedures with additional spreading of the breast tissue in type II deformities give good results. Severe cases (types III and IV) treated by augmentation and tissue spreading procedures have an unsatisfactory shape and have a 'second crease' deformity. For types III and IV, additional skin in the subareolar region by tissue expansion or flap procedures is necessary.

Keywords: Tuberous breast deformity, normal breast, TBD.

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1. Introduction

Rees and Aston were among the first to point out this unique deformity in the late 1970s as a distinctive alteration in breast morphology that becomes evident at puberty resulting in psycho-emotional and physical discomfort in women [1]. The first sign that draws the attention of a teenage girl is the presence of an obvious discrepancy in shape and/or volume of both breasts in unilateral cases or unnatural appearance of both breasts in bilateral cases. Sometimes, the cases were sham enough or unaware to seek a medical advice, so the definite incidence of prevalence of tuberous breast deformity is uncertain, with reported rates ranging from 6-73% in literatures [2]. The exact incidence of TB is unknown and underestimated as many women with mild degrees of deformity may n ot seek help. Patients usually ask for a surgical consultation if they present with unilateral TB (increasing the asymmetry to the contralateral breast) or in case of a severe bilateral presentation, as it may cause major psychological distress [3].

While female tuberous breast is well described, the tuberous male breast is a very unusual variant of gynecomastia, where the skin excess is disproportionally great in comparison to surplus bulk; with a relatively constricted base is also present. So the relative skin redundancy to be addressed even when the tissue excess is minor and so unattractive scarring is unavoidable. Male tuberous breast was poorly investigated and lacks a classification system in the current literature [4]. Only one study was specifically focused on prevalence of TB: a 5-year retrospective analysis on standard preoperative photographs of White female patients reported that the presence of at least one of the typical features characterizing TB is extremely common among the general population (27.6%). The high prevalence of TB is particularly common among women seeking breast augmentation and breast reduction (about 50%) [5].

2. Clinical presentation of the deformity

Several names had been used to designate this deformity include snoopy breast, conical breast, tubular breast deformity, domed nipple, lower pole hypoplasia, and many others [6]. The severity of the deformity depends on the degree of underdevelopment of the superficial layer of Camper's fascia, in the area below the areola, which determines a wide range of clinical presentations [7]. TBD is a spectrum of abnormalities in the development of the breast. Reduction of both vertical and horizontal breast diameters, enlargement of areola shape and size, elevation of the inframammary fold and moderate to severe hypoplasia of the breast skin and glandular tissue. Moreover, thickening of the fascia around the nipple–areola complex (NAC) sometimes creates a constricting ring and a weak point through the areola, which forces the breast to herniate toward the NAC. It arises during puberty and it is generally characterized by a range of gross alterations, such as contracted skin envelope (horizontally and vertically), constricted breast base, breast

Parenchyma volume reduction, abnormal elevation of the inframammary fold, areolar herniation of the breast parenchyma, and nipple-areolar complex (NAC) herniation associated with a normal breast base [5].

3. Etiology, genetics, and histological Characteristics

Many theories have been formulated to explain the development of TB. The etiology of this deformity is unclear; Glaesmer (1930) had suggested a phylogenetic relapse and Pers (1968) postulated that there is a failure of tissue differentiation in a limited zone of the fetal thorax. These theories were effective in explaining deformities consistent with amastia and Poland syndrome [8]. In earlier description of tuberous breast deformity, some authors suggest an anomaly in the quality of the skin of the areola with a deficiency of areolar fascial support. Another possible cause is the presence of a constricting fibrous ring at the level of areola, impeding both horizontal and vertical growth of the breast parenchyma; the gland herniates into the areola [8]. 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, with the presence of constricting fibrous ring at the glandular base made up of longitudinally arranged collagen and elastic fibers, which the developing breast cannot release, preventing peripheral radial expansion causing it to develop in a forward direction and giving breast its tubular appearance [9]. These theories have been more recently expanded with Mandrekas' description of the ring theory and Costagliola's discussion of the role of the weakened peri-NAC skin and fascia in predisposing to herniation of tissue into the areola [10].

Another theory suggested hormonal action implication, which promotes normal breast enlargement during puberty. In particular, estrogen hormone normally induces horizontal growth of the lactiferous ducts with a horizontal widening of the NAC while Progesterone normally induces lobular development with a vertical thrust. If this process is rapid and is not paralleled by expansion of the skin envelope, the breast will not able to spread radially and so the developing glandular tissue will project anteriorly and herniate through the areola. Histological studies had been performed to describe the differences of breast parenchymal components between TB and normal patients. TB patients showed histological evidence of a disorder deposition and concentrations of collagen fibers and dispositional abnormalities involving all the stromal components (derma, gland, adipose tissue, and fascia) compared with normal breasts. It supports the theory behind the presence of the superficial fascia fibrous ring [11]. The genetic implication has been investigated in a few studies, showing a correlation among homozygous twins and consanguineous, there was a correlation in the presence of TB among those lineages, thus presuming a possible genetic role in transmission of TB [11].

4. Classification Systems

Von Heimburg et al. [8] proposed a classification system that is routinely employed in clinical practice, based on four main types of tuberous breast [8]:

Type I: Hypoplasia of the lower medial quadrant

Type II: Hypoplasia of the lower medial and lateral quadrants with sufficient skin in the subareolar region

Type III: Hypoplasia of the lower medial and lateral quadrants with skin deficiency in the subareolar region

Type IV: Severe breast constriction with minimal breast base

Grolleau et al. [9] modified the Von Heimberg classification to describe only 3 groups, as no objective or clinical difference could be seen between Von Heimberg types II and III. This study graded constricted breast base as (Figure 1):

-Type I (lower medial quadrant deficiency).

-Type II (deficiency in both lower quadrants).

- Type III (deficiency of all 4 quadrants).

This classification also noted areolar herniation to be more frequent in type III breasts but did not include this feature in the classification. Persichetti et al. [12], rating the degree of asymmetry based on breast volume, the details of which are as follows:

• Grade A: mild (<200 g) • Grade B: moderate (between 200 and 400 g) • Grade C: severe (>400 g).

Pacifico and Kang [13] had been suggested a classification based on the degree of areolar herniation. They described an objective classification using the Northwood Index (NI), a ratio between the amounts of forward projection of the areola divided by the areolar diameter. NI was found to be 0.19 in normal breasts and 0.54 in tuberous breasts (on average). Tuberous breasts were then further divided into mild, moderate, and severe based on NI. Any NI that is higher than 0.4 was considered tuberous variety. Other classification systems had been proposed by several authors [3].

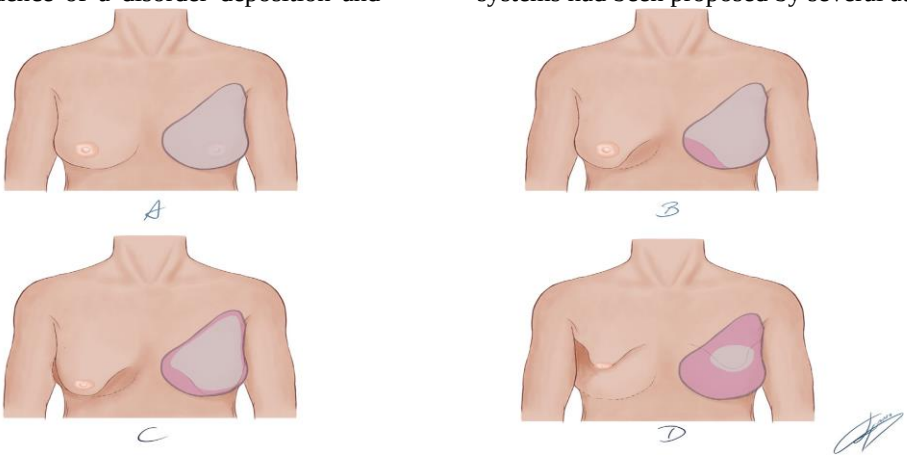

Figure (1): Grolleau classification of TBD. (A) Normal breast. (B) Type I: deficiency of the lower medial quadrant. (C) Type II: deficiency in both lower quadrants. (D) Type III: deficiency in all 4 quadrants, severe breast constriction and global hypoplasia.

References

[1] T.D. Rees, S.J. Aston. (1976). The tuberous breast. Clinics in plastic surgery. 3(2): 339-347.

[2] M.H. Brown, R.B. Somogyi. (2015). Surgical strategies in the correction of the tuberous breast. Clinics in plastic surgery. 42(4): 531-549.

[3] A. Innocenti, M. Innocenti, F. Mori, D. Melita, F. Ciancio, A. Cordova. (2018). Tuberous breast: past, present, and future: personal classification, treatment, and surgical outcomes. Annals of plastic surgery. 80(2): 104-108.

[4] A. Innocenti. (2019). Male tuberous breast: a rare variant of gynecomastia. Clinical considerations and personal experience: tips and tricks to maximize surgical outcomes. Aesthetic Plastic Surgery. 43: 1500-1505.

[5] M. Klinger, F. Caviggioli, S. Giannasi, V. Bandi, B. Banzatti, A. Veronesi, F. Barbera, L. Maione, B. Catania, V. Vinci. (2016). The prevalence of tuberous/constricted breast deformity in population and in breast augmentation and reduction mammaplasty patients. Aesthetic Plastic Surgery. 40: 492-496.

[6] A.D. Bach, U. Kneser, J.P. Beier, C. Breuel, R.E. Horch, M. Leffler. (2009). Aesthetic Correction of Tuberous Breast Deformity—Lessons Learned with a Single-Stage Procedure. The Breast Journal. 15(3): 279-286.

[7] S. Tenna, B. Cagli, B. Brunetti, M. Barone, P. Persichetti. (2017). Management of tuberous breast deformities: review of long-term outcomes and patient satisfaction with BREAST-Q. Aesthetic Plastic Surgery. 41: 1249-1258.

[8] D. Heimburg, K. Exner, S. Kruft, G. Lemperle. (1996). The tuberous breast deformity: classification and treatment. British journal of plastic surgery. 49(6): 339-345.

[9] J.-L. Grolleau, E. Lanfrey, B. Lavigne, J.-P. Chavoin, M. Costagliola. (1999). Breast base anomalies: treatment strategy for tuberous breasts, minor deformities, and asymmetry. Plastic and Reconstructive Surgery. 104(7): 2040-2048.

[10] M. Costagliola, B. Atiyeh, F. Rampillon. (2013). Tuberous breast: revised classification and a new hypothesis for its development. Aesthetic Plastic Surgery. 37: 896-903.

[11] M. Klinger, F. Caviggioli, F. Klinger, F. Villani, E. Arra, L. Di Tommaso. (2011). Tuberous breast: morphological study and overview of a borderline entity. Canadian Journal of Plastic Surgery. 19(2): 42-44.

[12] P. Persichetti, B. Cagli, S. Tenna, P. Simone, G.F. Marangi, G.L. Vecchi. (2005). Decision making in the treatment of tuberous and tubular breasts: volume adjustment as a crucial stage in the surgical strategy. Aesthetic Plastic Surgery. 29: 482-488.

[13] M.D. Pacifico, N.V. Kang. (2007). The tuberous breast revisited. Journal of plastic, reconstructive & aesthetic surgery. 60(5): 455-464.