



Capsular Contracture in Breast Reconstruction, Isn't it maybe just a Muscular Contracture?

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Editorial

In present times, conservative mastectomies, according to the definition of Veronesi [1], are largely adopted in breast surgical oncology. As a consequence, breast reconstructions, which are the natural second step of such procedures, are becoming more and more popular. As the numbers rise, a permanent debate and a relentless technical improvement are obviously involving all the specialists for better outcomes. In our country, as in the rest of Europe, Implant Based Breast Reconstructions (IBBRs) are the most common choice, sometimes more than 90% of the breast reconstructions performed [2]. In US as well, IBBR has been increasingly adopted in the last decades, reaching a rate of approximately 80% of all breast reconstructions [3]. There are several reasons for this preference towards a prosthetic based approach, namely invasiveness, time, costs etc...[4]. Nonetheless, IBBR is not always a pleasure cruise and, apart from early complications, there is a feared long-term pitfall: Capsular Contracture (CC).

Such a complication is defined as an excessive fibrotic reaction to the implanted breast prosthesis, with the formation of a thick capsule causing discomfort, sometimes pain, and also a distortion of the reconstructed breast mound. A commonly used tool of evaluation is the 4-grade Baker scale, where the fourth grade represents a painful, hard and cosmetically awful reconstructed breast.

This unpleasant inconvenience of breast implant use has been described in literature by several studies that have reported an incidence of CC ranging from 0.6% to 19% in breast augmentation to 19% to 48% in breast reconstruction [5]. More recent studies report a 10% rate in augmentation [6], while in IBBR the rate of this complication is estimated to be overall 9.8%, with the rate after Post-Mastectomy Radiation Therapy (PMRT) being 18.7% and 7.5% for patients without PMRT [7].

All these rates are, by the way, flawed by the grade of Baker scale that is considered the threshold for CC and mostly by the fact that such rating is always depending on the visiting surgeon and not objectively measurable.

Several factors have been claimed to be the "culprit": Factors such as infection, biofilms, irradiation, and hematoma and implant surface type. None of them, by the way, has ever been eventually identified as the "one". But, some new developments in surgical techniques of IBBR might help us resolve this surgical conundrum.

In fact, a real revolution has changed the IBBR scenario in the last few years, the pre-pectoral approach. This novel technique has been having a sky-rocketing success, really changing the IBBR paradigm.

Among all the advantages of such a technique, which are not part of present topic, there is, without any doubt, a striking long-term outcome of very low CC, trending towards 0% in many series, with an average value of approximately 5% from a recent meta-analysis [8]. Cases of CC are described in pre-pec IBBRs as well, but often they are related to PMRT or previous radiation. This is a particular type of fibrosis and a particular type of CC, which could be preferably considered as a separate entity [9]. As a matter of fact, the majority of CCs are not related to RT, and the type of fibrosis of a standard CC, not related to RT, is usually more a thickening of the capsule itself. Moreover, in the standard CC there are always two "bad companions" such as "the animation deformity" and "the window shutter effect". These two bad "guys" are never described or seen in a pre-pectoral reconstruction. Hence, a reasonable deduction is that being CC dramatically reduced in a pre-pec IBBR, along with animation deformities and window shutter effects, the standard CC we are often facing in IBBR could be just the effect of a mechanical process. This process entails a constant shearing force, between the implant and the muscle, which is obviously higher in a retro-pectoral IBBR than in a pre-pec setting.

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There is also another hint to highlight, which is related to another novel technical modification, which I personally described in 2017 [10] and which has been reported by other Authors as well afterwards [11-13]. This is the denervation of pectoralis major muscle in case of a retro-pectoral approach. Performing this simple maneuver, during the muscular pocket dissection, is possible to avoid the aforementioned animation deformities and window shutter effects, obtaining a more natural ptosis of the reconstructed breast, which resembles a pre-pec IBBR. But, most of all, this technical “trick” can really make the difference in case of a revisional surgery done for a long-standing CC. Capsulotomy and implant changing are not always the solution and might be temporary, while pectoralis major muscle denervation allows an immediate and definitive solution with a rewarding feeling for the patient and surgeon together.

In conclusion, in the tough “case” of the “capsular contracture mystery” there are two important clues: The pre-pec IBBR long-term impressive result in terms of low rates of CC and the pectoralis major muscle denervation as a definitive resolution of long-standing CC. We could, hence, say that we are almost close to impeach the real phenomenon that causes CC, namely a continuous, never-stopping and ominous muscular contracture of the pectoralis major muscle against the breast implant capsule.

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