

# A Short History of Breast Augmentation and Possible Future Perspectives

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## Editorial

Volume 1 Issue 1

**Received Date:** September 25, 2017

**Published Date:** October 04, 2017

**DOI:** 10.23880/ijtps-16000102

## Editorial

According to the annual survey of the international society of aesthetic plastic surgery, in 2016, 1,649,871 breast augmentation procedures were performed in the world, in particular 1,449,337 silicone breast implants and the remaining were fat transfer procedures and saline implants, with a trend steadily increasing from year to year, it will suffice to consider that between 2015 and 2016 the increase in silicone prostheses was 11%, and that of fat transfer was 22%. The country where this surgery is most required are United States of America 20.1% of all surgical procedures, followed by Brazil (13.2%) and Russia (5.1%) [1]. Despite the Breast Augmentation being one of the most accomplished surgery in the world, quite surprisingly, is a very recent surgical procedure compared with other such as eye or orthopedicsurgery that are rooted in history with historical testimonies of thousands of years ago. Indeed, the attention of the scientific community about breast atrophies or asymmetries was rather rare until the late nineteenth and early twentieth century's, one of the most innovative surgeon in this field, Passot, in 1930 noted that while he himself had performed more than 180 operations for hypertrophy, he had seen only 8 procedures performed to correct atrophy [2].

The first sources date back to the last part of the nineteenth century, with the first attempts to fill and remodel the breast with autologous tissue (fat transfer). According to literature, the very first attempt was performed in 1895 by Vincenz Czerny (1842 - 1916), a German surgeon that used a lipoma taken from lumbar region of a patient and transferred it to fill the defect in a breast that had been treated for fibrocystic mastitis.

According to the author, operation was successful and the lipoma was not reabsorbed but it is said that has stopped its growing [3].

In following years same technique was used by other authors and most of them anecdotally noticed fat tissue growing stopped after transplant. During the same period, the firsts attempt of free transfer fat tissue for breast augmentation were made, with a good approximation we can attest that the first was performed by Gustav Adolf Neuber, for correcting hypotrophic breast [4,5]. We have to wait until 1925 when Erich Lexer (1867 - 1937) published his 20 years of experience of free fat tissue transfer in augmentation mammoplasty from a cosmetic point of view, then in 1930, Raymond Passot (1894 - 1947) published his works on fat transfer taken from abdomen and buttocks and John Watson (1914 - 2009) in 1959 wrote a review on the application of free fat transfer in mammoplasty [6-10].

Both Lexer, Passot and Watson in different period of time stated that grafts had to be small in size in order to avoid necrosis and complications but vascular theory on fat survival was yet to come. Fat tissue was not the only method used in the past to obtain an additive mammoplasty, An Austrian surgeon, Robert Gersuny (1844 - 1924) described the injection of foreign material (paraffin), and then other surgeons tried to use different materials, such as vegetables oils, lanolin, liquid silicone, and even bee wax [11].

Shortly, side effects such as paraffinomas and other complications made clear that those materials were not

the solution.

Industrial development after Second World War, led to creation of many synthetic polymers, so surgeons begun to utilize sponges of polyvinyl alcohol or polyethylene molded to mimic the shape of the breast [11-14]. During 1950s and 1960s many implants were positioned, but again, problems of abnormal scarring, capsular contracture, and tissue reaction put an end to the use of sponges for breast augmentation. We have to wait until 1963, when Dr Thomas Cronin (1906 - 1993) together with his resident Dr Frank Gerow invented the first implant made of silicone gel, paving the way for a revolution in the field of plastic, reconstructive and aesthetic surgery. The first generation models were made of a silastic rubber wall and a viscous filling gel inside; unfortunately these prostheses were quite fragile, often leading to ruptures and silicone leakage which led to capsular contracture and skin deformities [15]. Early prostheses problems in late seventies and eighties led to a witch hunt against silicone implants in the US also because of suspects about a possible carcinogenicity of these implants began to circulate, so that saline implants firstly used by H. G. Arion in 1965, dominated markets for over 14 years. First saline implants were silicon prostheses inflated with physiological solution not very different from the ones used nowadays [16].

It was only in 2000 that meta-analysis stated that silicone implants were not harmful for connective tissues, but only in 2006 FDA cleared use of silicon prostheses for breast augmentation [11,17].

Author personal opinion is that future of breast augmentation will be linked to the new three-dimensional reconstruction techniques and bioprinting which will enable the construction of breast implants through a biocompatible scaffold on which the own patient's cells will be sown and let grow before being implanted again in patient's body, avoiding, hopefully, the problems associated with the alloplastic materials [18,19].

Plastic surgery has always been a field of great and continuous innovations, the same spirit of research and thirst for knowledge to exist in new generations of surgeons and researchers, and we can expect great innovations in this field in the near future.

## Acknowledgement

Author wants to thank Prof. Juan Carlos Pavani MD plastic surgeon from Buenos Aires for

his key points so useful for the implementation of this paper.

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