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Cover Page Footnote

The case provides the new information of: 1 Prolonged implanted breast prosthesis more than 30 years 3 Pleural effusion as the complication in non-ruptured breast 4 Sepsis



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Capsular Contracture, Prolonged Use of Breast Implant with Pleural Effusion: A Case Reports.

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Abstract

A case with prolonged implanted breast prosthesis experienced a prolonged capsular contracture complicated with pleural effusion. A complete capsular removal proceeded instead of removal of the prosthesis solely. The present case aimed to share experiences that may add to the scientific horizon regarding the rare complications of breast prosthesis and rarely reported.

Keywords: capsular contracture, breast prosthesis, pleural effusion

Introduction

No certainty to date about how long breast prosthesis may be safely implanted remains the problem encountered in daily practice. The lifetime of breast prosthesis has no expiry date as the medicine is. Indeed, the lifetime of breast prosthesis referred to the question asked by those who need breast augmentation. Some surgeon decides to replace after 10–20 years, while as others proposed earlier, but the reason not supported by strong evidence. In addition to lifetime, a different problem encountered where the complication found, such as capsule contracture,¹ infection, inflammatory and immune responses, or even malignancy² have been reported recommends prosthesis removal. Pleural effusion, which is an uncommon, rare complication following mammary bag rupture, has been first reported by Steven (1987).³ More than 25 years later, Shaik et al. (2015) published their finding, which is the recent report, namely foreign body reaction to silicone material of gel-filled breast prosthesis, that was ruptured.⁴

In this report, unusual complications of capsular contracture in prolonged implanted breast prosthesis, namely melted gel-filled silicone breast implant covered by thick calcified capsular contracture complicated with pleural effusion presented that may contribute to the literature.

Case illustration

A female of 61 years referred by the pulmonologist with a history of persistent pleural effusion. A repetitive tapping proceeded for the last two months. The effusion developed progressively over the previous two weeks requires frequent tapping. The condition worsened in the past five days, and the patient was labelled as sepsis. No tuberculosis and HIV infection in history-taking confirmed by the laboratory test. Body

weight remains 45–46 kg for the last 20 years. No family history of malignancy. On further history-taking, she underwent breast prosthesis implantation for more than thirty years. No accurate information about the type of prosthesis implanted. The abnormal shape of the breast realized for more than 20 years, and no action has been taken to solve this problem.

On physical examination, she looked cachectic, alert, no respiratory distress, and a stable hemodynamic. Breasts showed abnormal appearance (see figure 1 below) with normal skin over the chest, lobulated, firms, well-demarcated, and no pain. The laboratory findings showed hemoglobin content 3.5 g/dL, white blood cells count 3,500 cell/mm³, platelet count 185,000 cells/mm³. Serum albumin of 1.5 g/dL. C-Reactive Protein 92 mg/L. On CT scan, a pleural effusion denoted (see figure 2), and the effusion diminished following a tapping before surgery (see figure 3). Cytology has not proceeded as a correlation to malignancy was out of the thinking.

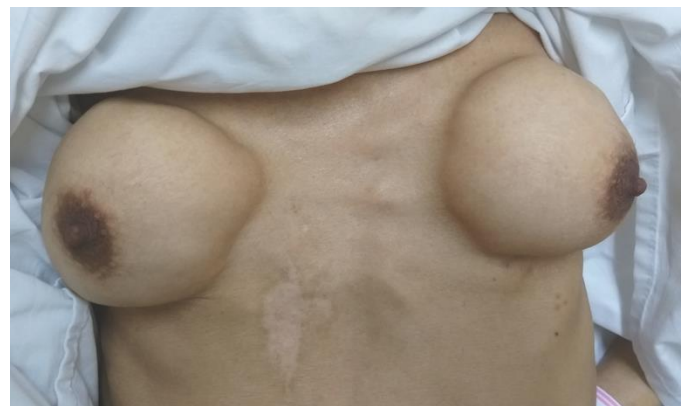


Figure 1. Female 61 years with prolonged capsular contracture in prolonged implanted breast prosthesis. The abnormal shape of the breasts is shown.

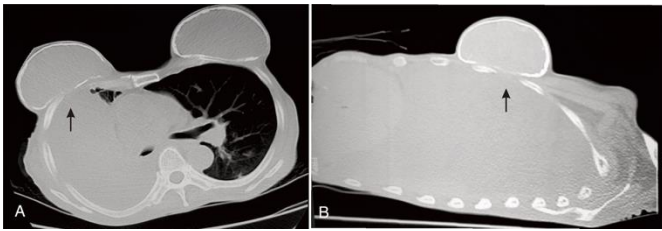


Figure 2. Pleural effusion clearly showed in axial (A) and sagittal projection (B). A blurred area in the intercostal space with a defect in the bag alignment of the right side denoted (arrows).



Figure 3. Chest ray took a day before surgery, showing diminished effusion. The capsular contracture clearly showed.

Simultaneously with blood including platelet transfusion, the surgical prosthesis removal planned under general anesthesia proceeded for source control. No prophylactic antibiotic given, but those given by the pulmonologist continued. The procedure started on the right side. Intraoperatively, a thick inelastic fibrous capsule found, and a capsulotomy proceeded (see figure 4A). It was difficult to remove the prosthesis solely intact as it melted (see figure 4BC). The thick capsule observed (see figure 4D), and to this finding, total capsulectomy proceeded—the complete removal procedure employed on the left side as well. Both pectoral muscles (major and minor) and its fascia as that thin (atrophic), and intercostal as well let it challenge to recognize. The intercostal muscles had the same boat. The bag of this smooth-surfaced prosthesis looks intact, but the gel-filled content damaged (see figure 4).

Intraoperatively, no active bleeding, but diffuse capillary oozing. A vacuum drain inserted and kept maintained for two days postoperatively and discharged on the third postoperative days; clinically improved. No bruising, nor hematoma and the stitches removed two weeks postoperatively. No surgical complication—no progression of the pleural effusion that needs tapping until 4th postoperative weeks. Unfortunately, in the next two weeks after the last follow up, nobody knew the subject died while she sleeps at home—no family nor relative and the guardian he had, thus the author unable to provide the consent. Pathology findings showed a dense collagen distribution in the capsule and loose collagen ones. Amorphous bodies found discretely, and calcified field denoted massively—no features of malignancy identified in the fields.

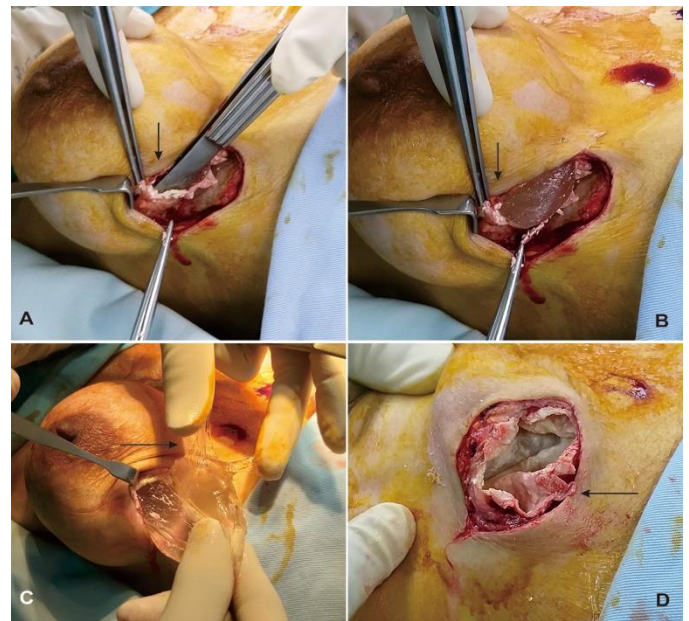


Figure 4. Surgical removal of the prosthesis. A. Capsulotomy proceeded through the inframammary approach. A. thick calcified capsule with fragile calcified material. B. Showing an intact prosthesis following capsulotomy. C. Removal of the prosthesis was difficult as the prosthesis melted as if a glue. D. Showing the calcified fibrotic capsule.

Discussion

The present study is reporting a case enfacing problem of a prolonged implanted breast prosthesis (30 years) complicated with capsular contracture with non-ruptured bag, and pleural effusion. The capsular contracture realized for 20 years (or the tenth year after prosthesis implantation), which not treated.

The term prolonged referred to a relative because no definite lifetime defined for how long the prosthesis may safely be implanted, even though attributed to inert material. Many argue for ten years but somehow not supported by strong evidence. Thirty years implanted prosthesis referred to an unusual event.

Capsular contracture

The capsular contracture is first reported somewhere in the 1990s as a complication that after prosthesis implantation and had been widely studied recently. It was Spear (1995), the one who classifies,⁵ and lately, Headon and colleague (2015) reviewed it comprehensively.¹ There are known factors responsible for the development of capsule formation, which, in turn, develops into a contracture at a later date. Firstly, inadequately evacuated hematoma resolved with the organization of blood clots with the formation of a fibrous tissue resembling the capsule surrounding the prosthesis. Studies showed that following implantation, a thin gel-like substance comprises matrix proteins covering the prosthesis—namely, biofilms. Based on the analysis of the biofilms, it thought to be responsible for later capsular contracture. The other studies reporting the biofilms referred to the best media for the colonization and the development of bacteria.^{6–8} The following condition explains why the infection is difficult to treat until the implant removed.

It is clearly understood that the body's response by mobilizing more fibroblasts to the films leading to the capsular formation in the presence

of prosthesis – which is a foreign body – and thickening, even contractures. Matrix metalloproteinase plays an essential role in capsular contracture.⁹ The stigmata of chronic inflammation let the formation of granulomatous tissue, thickening calcified fibrous tissue, and even ossification.⁷ Secondly, the surface of the mammary prosthesis. Studies show that smooth-surfaced prosthesis, as in the presented case, has a high tendency to have capsular contracture compared to the textured ones. For this reason, textured – surface prosthesis referred to the first-choice prosthesis, recently.¹⁰ Thirdly, the condition described in the earlier paragraph logically occurs should there is a rupture of the prosthesis bag. Even though silicones approved as safety material, the gel-filled, which is a foreign body, may induce the inflammatory response. The longer the inflammatory process continues, the higher the tendency to the development of capsular contracture. Should it have left unmanaged – which is a complete prosthesis plus capsule removal – then the inflammatory response extends to the adjacent tissue and, this phenomenon confirmed by the increased C-reactive protein. This brief description is not trying to repeat what Headon comprehensively described previously but summarizing the points that may lead us to the link to the later complication.

Pleural effusion

Pleural effusion as a complication following mammary prosthesis implantation is extremely rare. To date, only four articles were reporting such a complication. It was Steven (1987), who is the first reporting this infrequent complication,³ followed by Taupmann and Adler (1993),¹¹ Hirmand et al. (1994),¹² and Shaik et al. (2015).⁴ Those four articles were reporting the case with pleural effusion associated with the rupture of the mammary bag. It clearly understood that the body's response (in this case, pleural effusion) to silicone material (foreign body) following a bag rupture, it is quite logic. However, the elaboration of pleural involvement as a response to foreign bodies in the non-ruptured bag needs more attention and should be addressed with criticism.

There are two possibilities regarding pleural involvement in this case. Firstly, a direct impact. It assumed based on the intraoperative findings showing disfigured adjacent tissue. Muscular atrophy (both of pectoral muscles and its fascia, intercostals, and its fascia of the areolar segment) let the anatomical barrier to the pleural cavity is not well resembled. This anatomical defect found posterior to the capsule and may respond to pleural involvement. CT scan showing a blurred area suggesting pleural involvement (figure 2).

Secondly, the possibility based on the theory. The lymphatic vessel involvement associated with the endothelium builds up the vessel wall, as the Centrepoint of inflammation.^{13,14} The lymphatic vessels in the areola and its efferent branches collected into two trunks that pass to the pectoral group of axillary glands. The vessels which drain the medial part of the breast pierce the thoracic wall and end in the sternal glands. At the same time, a vessel has occasionally been seen to emerge from the upper part of the breast and, piercing the pectoralis major, terminate in the sub clavicular glands. To this anatomical base, pleural involvement in this chronic inflammatory response to the prosthesis may be understood. To the second possibility, no evidence provided, as we didn't take a specimen from intercostal space, as it not ethical.

The subject experienced a chronic inflammatory response that us a lot of energy leading to body wasting, low-level albumin, as well as a defect in the immune system. The low platelet count reinforces this fact and is

no correlation to infection (sepsis), as many surgeons thought.¹⁵ In such a condition, the capsule referred to as a burden has to be removed entirely.

The question of how long a prosthesis might keep implanted – as a common question and frequently asked questions of a candidate before breast augmentation – remains unanswered. To date, there is no basic science nor strong evidence that could answer such a problem, but clinical reports of the level four evidence.

Summary

This case presented a valuable clinical experience in management a rare complication of prolonged capsular contracture in a prolonged implanted breast prosthesis. The key message to be delivered was a prolonged implanted prosthesis that should be avoided, even though there was no definitive nor strong evidence showing the exact lifetime. Capsular contracture as a common complication following implantation breast prosthesis should be prevented and managed immediately through a complete capsule removal to avoid further complications, as in this case.

Disclosure

The author declares no conflict of interest

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