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Silicone Induced Granuloma of Breast Implant Capsule (SIGBIC) At Polarized Light Microscopy

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Abstract

Due to the large current evidence of Breast Implant Associated Anaplastic Large Cell Lymphoma (BIA-ALCL) more fibrous capsules specimens are being referred for histological evaluation. In the past, these capsules were often discarded without expert analysis to determine the presence of pathologies. Currently, when submitted to histological study, it is often only important to exclude the presence of BIA-ALCL.

However, some additional information may be obtained from the fibrous capsule that could justify its pathology. Among these information, the presence of silicone corpuscles resulting from gel bleeding in intact breast implants is highlighted. We recently associated the presence of free silicone with granuloma development.

This 2 cases report demonstrates the role of polarized light microscopy in the diagnosis of granuloma induced breast implant capsule (SIGBIC).

Keywords: Silicone; Histopathology; Lymphoma; Macrophage

Introduction

Currently, there is a consensus to submit the explanted fibrous capsule for histological study after en-bloc capsulectomy, mainly due to the increased number of BIA-ALCL reported. [1.2]

However, there is little standardization of optimized histological evaluation and information in the final report. [3.4]

In this report of 2 cases, we present the importance of polarized light microscopy in diagnosing free silicone corpuscles within the fibrous capsule.

Case Report

A 53-year-old female underwent explantation of a silicone breast implant due to capsular contracture. The implantation surgery was seven years ago for aesthetic purposes. For one year, she presented breast enlargement and pain episodes that remit with non-hormonal anti- inflammatory drugs. On a physical examination, she had a Baker type III capsular contracture. She underwent a surgical enbloc capsulectomy where the material was sent for histological analysis.

At the macroscopic examination, the silicone implant showed no signs of rupture.

Histological examination of the fibrous capsule by the optical microscope (OM) showed a fibrotic wall with synovial metaplasia without atypia and histiocytic reaction with foreign body type reaction. It was also possible to see in the inflammatory process giant cells and discrete nonspecific lymphocytic infiltrate without atypia. Interestingly, the giant cells show well- defined and clear vacuoles (foreign body), inferring foreign material but challenging to determine the etiology by OM. However, when analyzing the material with polarized lenses, non-polarized refringent material was observed inside these vacuoles, compatible with silicone. (Figures 1 and 2)

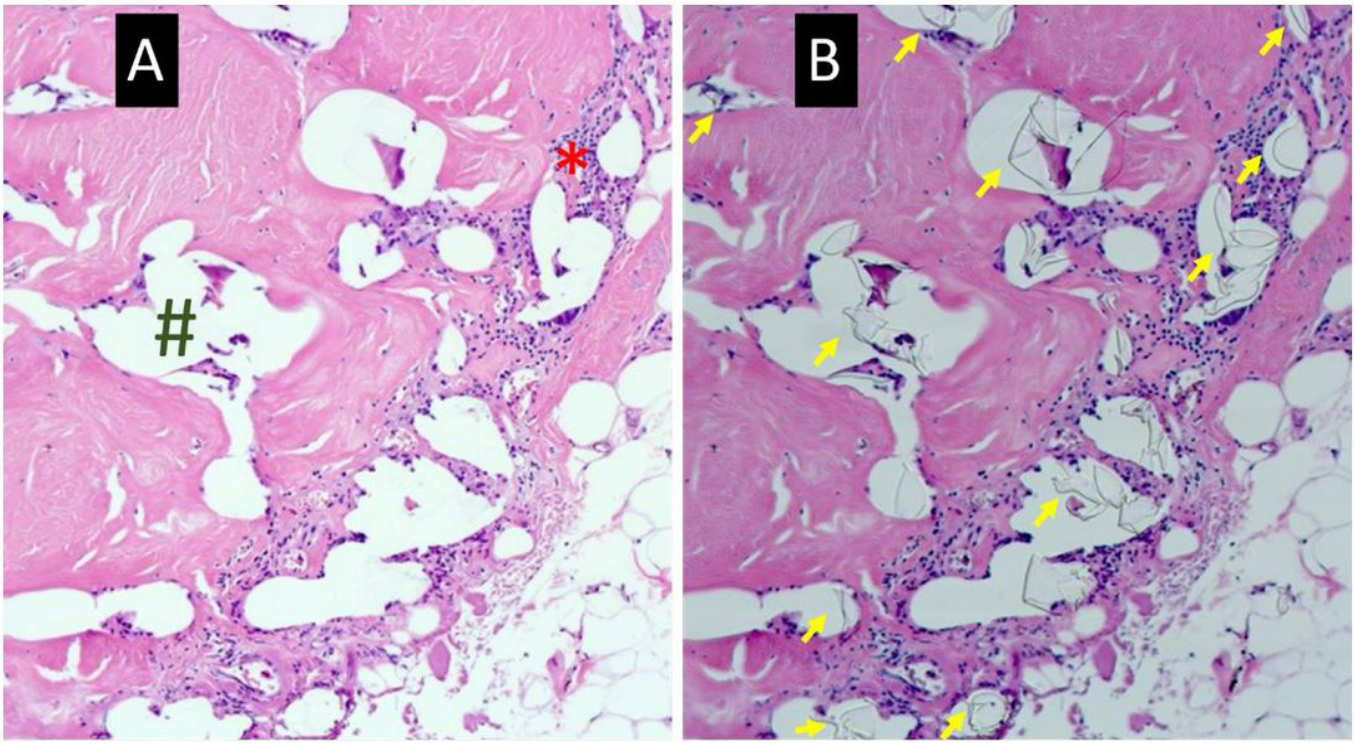

Figure 1 (a,b): Histology of the fibrous capsule at optical microscopy (OM) without (a) and with (b) polarized lenses. A 53 years-old female with breast implant for 7 years. OM showed a fibrotic wall with foreign body type reaction with giant cells, histiocytic reaction with synovial metaplasia without atypia (green #), and discrete nonspecific focal lymphocytic infiltrate without atypia (red *). At polarized lenses, non-polarized refringent material was observed inside these vacuoles, compatible with silicone (yellow arrows)

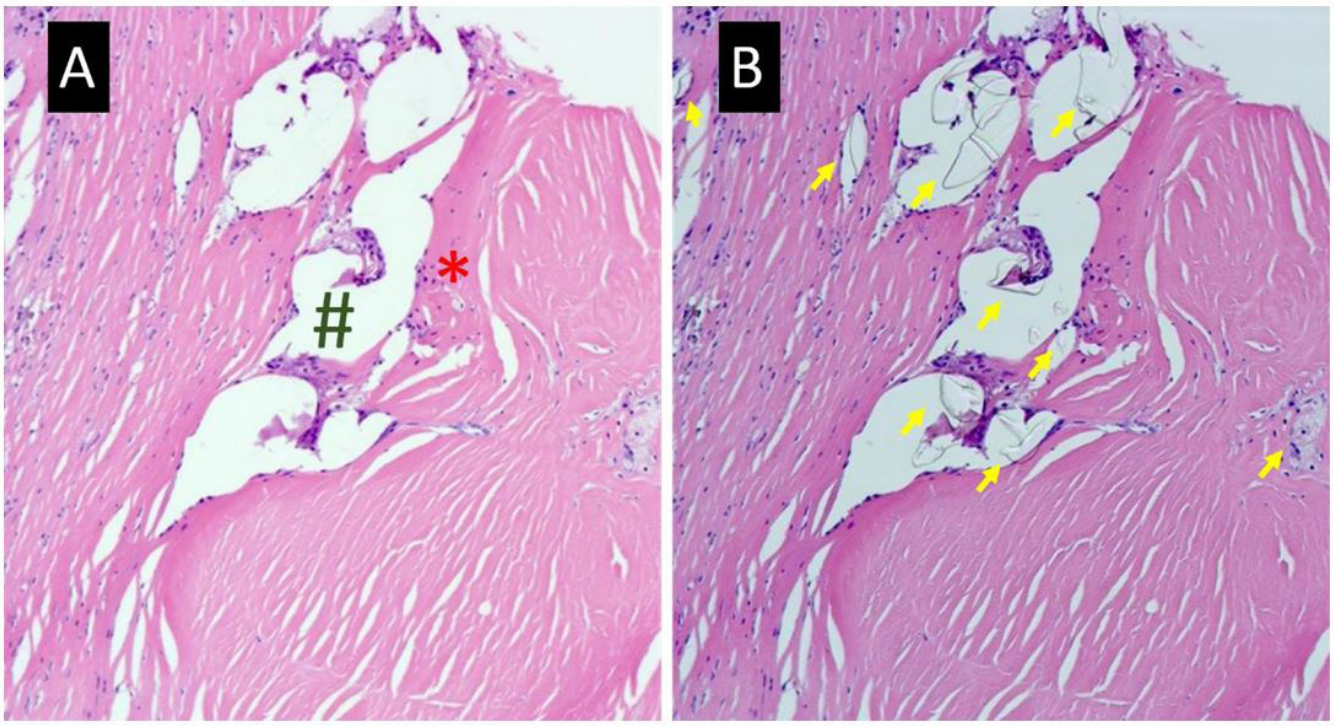

Figure 2 (a,b): Histology of the fibrous capsule at optical microscopy (OM) without (a) and with (b) polarized lenses. Another patient with capsular contracture with the same findings. Foreign body type reaction with giant cells, histiocytic reaction with synovial metaplasia without atypia (green #), and discrete nonspecific focal lymphocytic infiltrate without atypia (red *). At polarized lenses, non-polarized refringent material compatible with silicone (yellow arrows)

Discussion

Recently, we described SIGBIC (silicone-induced granuloma of breast implant capsule) as a fibrous capsule immunological reaction to an inflammatory foreign body response. It assumes that all silicone implants, saline or gel content, showed bleeding or shell deterioration, releasing silicone corpuscle to the intracapsular space. [2,4] However, we believe that SIGBIC is underdiagnosed in clinical practice for a few reasons, the main ones: 1. Lack of pathologist knowledge to report the foreign body etiology; 2. Non-use of OM polarized lenses; 3. Lack of preoperative SIGBIC imaging diagnosis.

In the preparation process of the surgical specimen OM slides, xylol is used in one step, called diaphanization. Xylene is a derivative of petroleum, with wide commercial availability. The goal of xylene is to clean the waste after using the absolute alcohol to dehydrate the material. In addition, xylene is miscible with paraffin which facilitates cuts by the microtome.

Silicone is soluble in xylene, which is eliminated after this substance use, leaving a bright, shine, and well-defined vacuole in its place. When using polarized lenses for diagnosis, it is possible to identify residual material inside these vacuoles, where the silicone will appear as refractive and non-polarized material. [5,6] Silicon may also be present in the intracellular form where light spheres are located within histiocytes that sometimes looks like lipoblasts. [4]

In this case report, we present a typical case of foreign body reaction granuloma due to silicone bleeding in the fibrous capsule of the breast implant in patients with a history of capsular contracture. We show the importance of knowing the gel bleeding in the pathophysiology of capsular contracture and knowledge of their appearance at OM or OM with polarized lenses. Reports of silicone presence at OM in the breast implants fibrous capsules are rare. [5,6] Considering the clinical importance of these findings, especially in cases of ASIA syndrome (Autoimmune / inflammatory Syndrome Induced by Adjuvant), where SIIS (Silicone Implant Incompatibility Syndrome) is the most critical syndrome related to breast implants, SIGBIC and BIA-ALCL (Breast Implant-Associated Anaplastic Large Cell Lymphoma), its differential diagnosis should always be remem-

bered. It is noteworthy that there is still no definite cause of BIA-ALCL, and the authors speculate that silicone gel bleeding may be the trigger for this pathology development.

Conclusion

We believe that SIGBIC is underdiagnosed at OM because of the lack of knowledge of pathologists of the gel bleeding in macroscopic intact breast implants and its high frequency in clinical practice. From the reporting of these findings we can determine the real impact of these changes in our routine studies and the clinical relevance of these findings.

Conflict of Interest

The author(s) declare(s) that there is no conflict of interest regarding the publication of this article

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