

Interpositional Arthroplasty Using Mammary Capsule for Finger Joints: A Novel Technique

Felipe Mesa, MD, PhD*; Federico López, MD†; Sara Mesa, MD‡

Sir,

IS THE USE OF THE BREAST IMPLANT CAPSULE FOR RECONSTRUCTION SAFE?

In plastic and hand surgery, the sequelae that arthritis produces in the joints in their anatomy and functionality are of great personal, economic, and social impact and are worth treating.

We will discuss in which patients, interpositional arthroplasty can be performed in the proximal interphalangeal joints with a breast capsule as an innovative technique, as well as the potential risk of this procedure.

Among different kinds of arthritis, osteoarthritis (OA), rheumatoid arthritis (RA), and gouty arthritis (GA) are the 3 most prevalent diseases. OA is a noninflammatory degenerative joint disease that is caused by overuse of joints or aging, causing pain and disability to numerous people worldwide. RA is an autoimmune chronic inflammatory arthritis associated with the attack of autoantibody on the synovium and soft tissue, causing severe joint deformation and dysfunction. GA is a disease associated with uric acid crystal deposition, which causes severe pain during acute attacks and severe inflammation of joints.¹⁻³

According to these findings, OA is the main cause of arthritis in the world and the one that most generates deformities. Our work focused on this group of patients. Compared to other diseases that destroy joints, inflammation is not as severe and its evolution and pathophysiology is different; information that is important to keep in mind for the reconstruction of the joints.

In the prevalence of OA, it is estimated that up to 70%–90% of those over 75 years old have some radiological sign of OA in the hands,⁴ and it may produce symptoms in only 10% of these patients and is more disabling in women than in men.⁵⁻⁸ The prevalence of hand OA is more common in workers who perform long and repetitive manual labor compared to other types of workers.⁹

From *Titular Professor of Plastic Surgery, CES University, Medellín, Colombia; †General Surgery, CES University, Medellín, Colombia; and ‡ General Physician, CES University, Medellín, Colombia.

Answer to the letter sent from Marcus Vinicius Jardim Barbosa, MD, PhD.

Copyright © 2020 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of The American Society of Plastic Surgeons. This is an open-access article distributed under the terms of the [Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 \(CCBY-NC-ND\)](#), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Plast Reconstr Surg Glob Open 2020;8:e2878; doi: [10.1097/GOX.0000000000002878](#); Published online 21 September 2020.

Currently, there are data to think that a genetic factor is present in up to 50% of cases in most forms of OA.^{10,11}

After evaluating the deformity in the hands, we asked ourselves which reconstruction technique is the best to use; joint replacements are a good alternative with all the problems that these carry, such as synovitis, fractures of the implants or bone resorption, infections or other conditions, and poor functional results in the medium and long term; therefore, we considered that autografts were the best option for reconstruction in this patient. Reports in the literature have not shown any tissue that is suitable due to its physical characteristics in arthroplasties, and it was for this reason that we considered using the medium-thickness mammary capsule which could be found in mild or moderate capsular contracture, without any related breast pathology. We evaluated the studies by Kuriyama et al¹² regarding the breast capsule and found that the scores demonstrated that the structure of the collagen fibers in the textured group were similar to normal collagen fibers. Many elastic fibers were observed in the capsular tissue. There was a significant increase in myofibroblasts in the capsule around.¹³

Properly discussing the breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) T-cell, it is a late disease (8–10 years) and appears with periprosthetic fluid or seroma, the most common presentation (90% of the cases), also pain and swelling in the breast and sometimes as a mass lesion.¹³

A combination of textured breast implant, bacterial contamination, and genetic predisposition seems to be necessary for BIA-ALCL to occur. There are 35 million patients with implants in the world, and at the present moment, 573 cases of BIA-ALCL have been reported.¹⁴⁻¹⁷ Systematic review of the literature via PubMed covering cases series, modes of presentation, cytological, histological and immunohistochemical features, and disease outcome, since 1997, shows that 518 cases throughout 25 countries have been registered on the American Society of Plastic Surgeons PROFILE registry, with an estimated risk for women with an implant of 1–3 per million per year. The neoplastic cells are highly atypical, consistently strongly positive for CD30, with 43%–90% also positive for EMA, and all are ALK-negative. Behavior is best predicted using a staging system for solid tumors.¹³

We consider that the comment of Dr. Marcus Vinicius Jardim Barbosa regarding the risk of acquiring anaplastic large cell lymphoma with the reconstruction technique is relevant; it is worth studying to be able to conclude if it is a safe technique.

To conclude with these previous data, we consider that using the slightest contracture capsule that provides tissue in good macroscopic conditions in an asymptomatic

patient in relation to the previous symptoms, the risk of suffering this disease in this surgery is really infrequent.

Felipe Mesa MD, PhD

Titular Professor of Plastic Surgery, CES University
Medellin, Colombia

E-mail: felipemesabetancourt@gmail.com

DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

REFERENCES

- Peña Ayala AH, Fernández-López JC. Prevalence and risk factors in osteoarthritis. *Rheumatol Clin.* 2007;3(suppl 3):S6–S12.
- Moskowitz RW, Howell DS, Altman RD, et al. *Osteoarthritis: Diagnosis and Medical and Surgical Management.* Philadelphia: WB Saunders; 2001.
- Altman R, Alarcón G, Appelrouth D, et al. The American College of Rheumatology criteria for the classification and reporting of osteoarthritis of the hand. *Arthritis Rheum.* 1990;33:1601–1610.
- Wilder FV, Barrett JP, Farina EJ. Joint-specific prevalence of osteoarthritis of the hand. *Osteoarthritis Cartilage.* 2006;14:953–957.
- Ouellette EA, Makowski AL. How men and women are affected by osteoarthritis of the hand. *Orthop Clin North Am.* 2006;37:541–548.
- Lawrence RC, Helmick CG, Arnett FC, et al. Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. *Arthritis Rheum.* 1998;41:778–799.
- Zhang Y, Niu J, Kelly-Hayes M, et al. Prevalence of symptomatic hand osteoarthritis and its impact on functional status among the elderly: the Framingham Study. *Am J Epidemiol.* 2002;156:1021–1027.
- Dahaghin S, Bierma-Zeinstra SM, Ginai AZ, et al. Prevalence and pattern of radiographic hand osteoarthritis and association with pain and disability (the Rotterdam study). *Ann Rheum Dis.* 2005;64:682–687.
- Hadler NM, Gillings DB, Imbus HR, et al. Hand structure and function in an industrial setting. *Arthritis Rheum.* 1978;21:210–220.
- Spector TD, MacGregor AJ. Risk factors for osteoarthritis: genetics. *Osteoarthritis Cartilage.* 2004;12(suppl A):S39–S44.
- Wright GD, Hughes AE, Regan M, et al. Association of two loci on chromosome 2q with nodal osteoarthritis. *Ann Rheum Dis.* 1996;55:317–319.
- Kuriyama E, Ochiai H, Inoue Y, et al. Characterization of the capsule surrounding smooth and textured tissue expanders and correlation with contracture. *Plast Reconstr Surg Glob Open.* 2017;5:e1403.
- Jones JL, Hanby AM, Wells C, et al; National Co-ordinating Committee of Breast Pathology. Breast implant-associated anaplastic large cell lymphoma (BIA-ALCL): an overview of presentation and pathogenesis and guidelines for pathological diagnosis and management. *Histopathology.* 2019;75:787–796.
- Groth AK, Graf R. Breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) and the textured breast implant crisis. *Aesthetic Plast Surg.* 2020;44:1–12.
- Knight R, Loch-Wilkinson A, Wessels W, et al. Epidemiology and risk factors for breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) in Australia & New Zealand. *Plast Reconstr Surg Glob Open.* 2016;4(9 suppl):94–95.
- Thibodeau R, Fan KL, Wehner PB. Stage IV breast implant-associated anaplastic large-cell lymphoma with complete pathologic response to neoadjuvant chemotherapy. *Plast Reconstr Surg Glob Open.* 2019;7:e2446.
- Munhoz AM, Clemens MW, Nahabedian MY. Breast implant surfaces and their impact on current practices: where we are now and where are we going? *Plast Reconstr Surg Glob Open.* 2019;7:e2466.