Omega-3 fatty acids may prevent breast implant complications, like capsular contracture

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For women receiving breast implants during reconstructive or cosmetic breast surgery, scarring around the implant—called capsular contracture—is a common, costly, and painful complication. The anti-inflammatory effects of omega-3 fatty acids, found in fish oil, might help to avoid abnormal capsule formation suggests an experimental study in the March issue of *Plastic and Reconstructive Surgery*, the official medical journal of the American Society of Plastic Surgeons (ASPS).

Mice fed omega-3 fatty acids had reduced capsule formation occurrence around implants—likely due to reduced collagen deposits—according to the research by Giuseppe A.G. Lombardo, M.D.,Ph.D., of Cannizzaro Hospital in Catania, Italy and Serena Tamburino, MD, of Chi.Pla Plastic Surgery in Catania, Italy, and colleagues. "We believe that omega-3 supplement is a simple and promising method that could be used to prevent or at least reduce capsular contracture after silicone implant surgery," the researchers write.

When any foreign tissue is implanted, the body naturally develops connective tissue around it. But in capsular contracture, the tissue hardens into a shell that becomes thicker and firmer over time. This results in inflammation, pain, and sometimes dislocation or deformation of the implant. Repeat surgery is sometimes needed to remove the capsule and replace the implant.

"Past research on preventing capsular contracture has focused on reducing bacterial contamination using antibiotics," Dr. Tamburino comments. "Fewer studies have focused on controlling the inflammatory process, particularly the arachidonic acid cascade, the main pathway leading to inflammation."

Omega-3 fatty acids—found in oily fish, as well as fish oil supplements—play a major role in the arachidonic acid cascade. The researchers designed a study to see if omega-3 fatty acid supplementation affects capsule formation around implants in animals. Tiny silicone implants were surgically placed under the skin of anesthetized mice. One group of animals was regularly fed an omega-3 fatty acid supplement, while a control group received water.

After several weeks, capsule formation around the implants was compared between groups. The results showed reduced capsule formation in the group receiving omega-3 supplementation—the implants were thinner and more transparent than in the comparison group.

In addition, capsules from the omega-3-supplemented animals showed reduced expression of transforming growth factor (TGF) beta-2: a cell-activating protein (cytokine) that promotes inflammation. The reduction in TGF beta-2 expression was associated with decreased collagen deposits in the implant capsule.

Could fish oil help to prevent capsular contracture in women undergoing breast surgery using implants? It's too early to say—for one thing, for humans to take a level of omega-3 supplementation similar to that given to rats in the study "would be quite a dose," the researchers write.

"Moreover, we still don't know if this treatment would provide long-term benefit," Dr. Tamburino and coauthors add. "Further clinical studies are warranted to examine their therapeutic applicability and additional studies should be conducted to support our findings concerning the decrease in capsular contracture occurrence."

More information: Giuseppe A. G. Lombardo et al, The Effect of Omega-3 Fatty Acids on Capsular Tissue around the Breast Implants, *Plastic and Reconstructive Surgery* (2020). DOI: 10.1097/PRS.0000000000006553

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