

CAPSULAR CONTRACTURE AFTER BREAST AUGMENTATION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Introduction

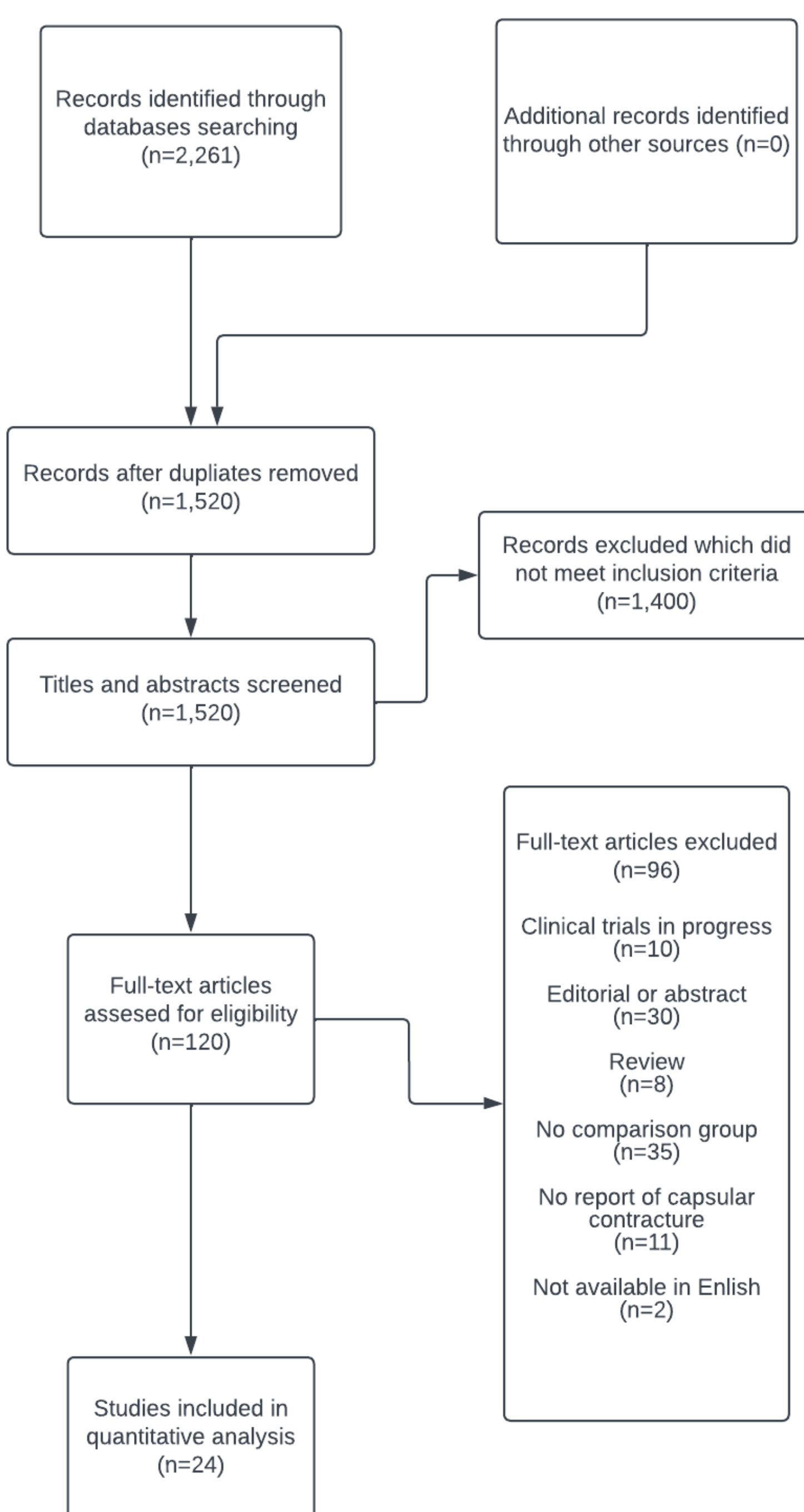
- Augmentation mammoplasty ranks as one of the most frequently performed aesthetic surgical procedures
- Capsular contracture, thought to be an inflammatory response in which a fibrotic capsule forms around the implant, is one of the most common long-term complications and indications of reoperation
- This meta-analysis reviews the literature comparing capsular contracture incidence rates between implant surface types, plane of placement, implant filler material

Purpose

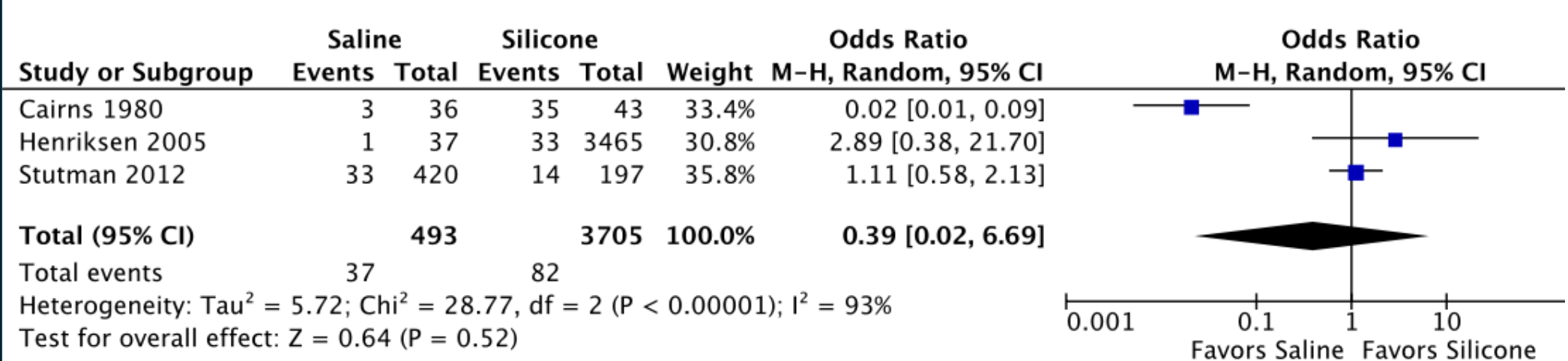
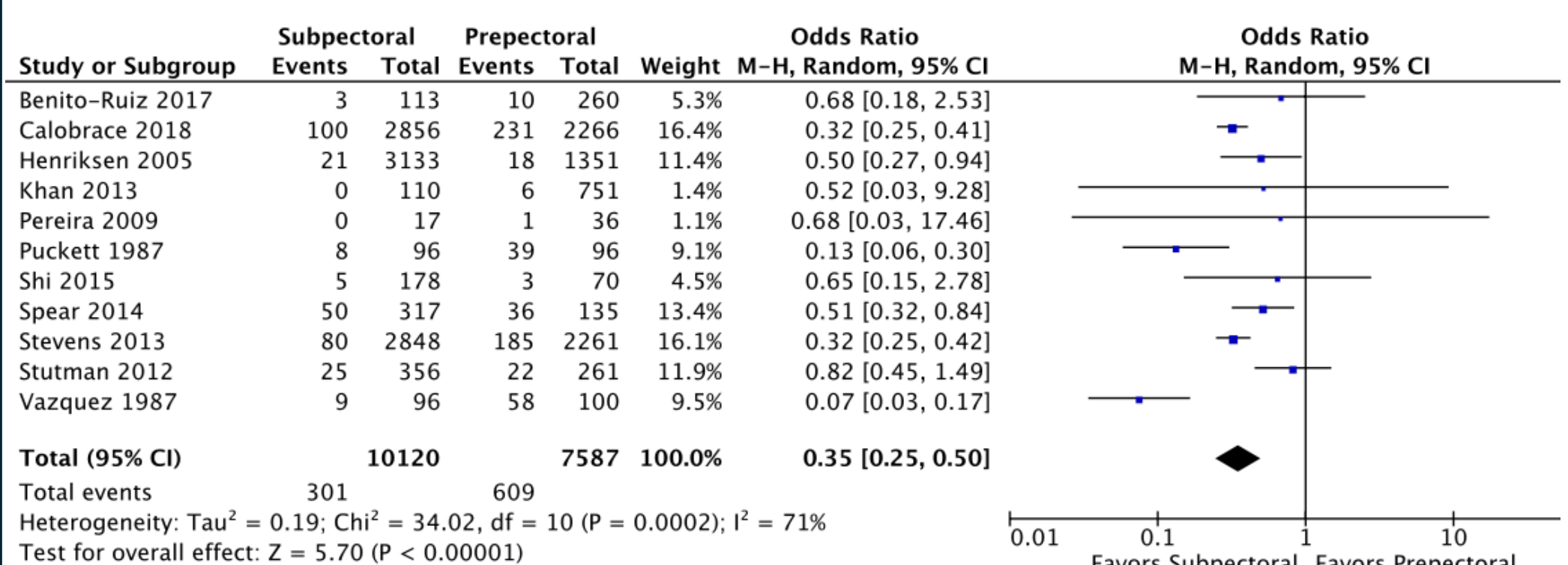
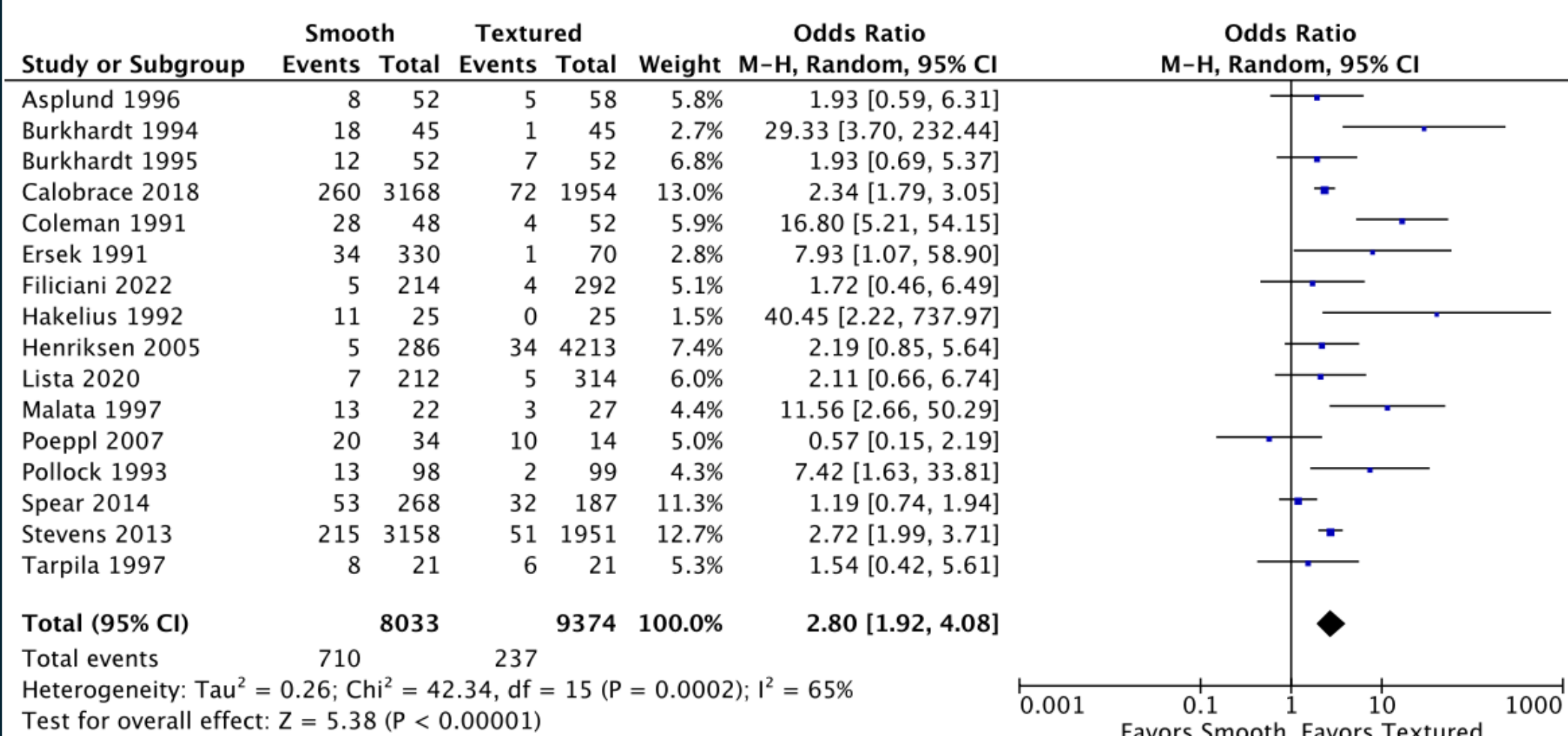
- To comprehensively collect and analyze findings from existing research to better understand the potential causes of capsular contracture following breast augmentation
- To identify specific risks associated with different surgical techniques and materials and empower surgeons and patients to make informed decisions regarding breast augmentation procedures

Methods

- A systematic review and meta-analysis were performed as per the PRISMA guidelines (Prospero CRD42024529482)
- Online databases PubMed MEDLINE, EMBASE (OvidSP), and Cochrane libraries were included in the search - Included studies reported incidence of, and clearly defined capsular contracture as Baker grade III or IV
- Study groups were compared and stratified by surface texture of the implant (smooth versus textured surface), plane of implant placement (subpectoral versus prepectoral) and filler material (saline versus silicone)
- Odds ratios (OR) were calculated for capsular contracture for each of these groups



Results



- 16 studies (17,407 cases) were analyzed to compare **smooth versus textured breast implants**
- Textured implants were associated with significantly lower rates of capsular contracture when compared to smooth implants, with an odds ratio (OR) of 2.80 (95% confidence interval [CI]: 1.92, 4.08)
- 11 studies (17,707 cases) compared the outcomes of **subpectoral versus prepectoral implant placement**
- Subpectoral placement was found to be significantly more effective in reducing capsular contracture rates than prepectoral placement, as evidenced by an OR of 0.35 (95% CI: 0.25, 0.50)
- 3 studies (4,198 cases) compared **saline versus silicone filled implants** and revealed no statistically significant difference in capsular contracture rates between the two types of implants, with an OR of 0.39 (95% CI: 0.02, 6.69)

Conclusions

- Lower rates of capsular contracture with textured implants may be explained through the mechanism by which greater surface area of textured implants results in upregulation of adhesion-related genes in breast-derived fibroblasts, thus reducing excessive motion of the implant that may provoke the overproduction of collagen and ultimately lead to contracture (46-49)
- Lower rates of capsular contracture seen with subpectoral placement may be explained through the preservation of the blood supply of the pectoralis major, as well as providing cushioning and flexibility for the implant in the submuscular pocket (52)
- The pectoralis major muscle provides greater coverage than the superficial fascia used in prepectoral placement; thus, restricting implant movement and improving adhesion (10)
- Submuscular placement has anatomic advantages which include avoiding of breast parenchyma and minimization of contact between implant and bacteria in breast ducts (53,54)

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