SH13: Should a Bovie be used for skin incision?

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Answer: Unknown. There is limited evidence to determine whether electrocautery should be used routinely for skin incision during shoulder arthroplasty. Studies outside of the shoulder literature have demonstrated its safe implementation with regards to improved blood loss, decreased postoperative pain control, similar infection rates, and similar scar cosmesis in different surgical disciplines.

Strength of recommendation: Limited

Rationale: A comprehensive literature review was preformed to identify all studies regarding the use of Bovie for skin incision in shoulder arthroplasty. Searches involved the terms "Bovie" or "electrocautery" or "electrocoagulation (is a MESH term)", and "skin incision" or "deltopectoral approach", and "shoulder replacement" or "shoulder arthroplasty" using the search engines PubMed and Google Scholar which were searched through January 2025. Inclusion criteria for our systematic review were all English studies (Level I-IV evidence) that reported on the clinical outcomes of the use of Bovie or electrocautery for skin incision in shoulder arthroplasty. Exclusion criteria were non-English language articles, non-human studies, retracted papers, case reports, review papers, studies with less than 10 patients, studies without clinical follow-up/infection rates, and technique papers without patient data. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) criteria were followed. We identified one article from PubMed (1 found, 1included) and zero from Google Scholar (54 found, 0 included) that met all criteria. Given the limited number of articles identified with the search terms used, searches were separately performed to identify studies on the use of Bovie for skin incision outside of the shoulder literature.

Cutibacterium acnes (*C. acnes*) is the most commonly detected pathogen in primary and revision shoulder arthroplasty. (1) Incision with a scalpel is thought to be one of the mechanisms through which *C. acnes* is released onto the surgical field. (1,2) Electrocautery has long been used as an alternative tool for dissection and hemostasis and is of especial interest in shoulder arthroplasty given its potential to heat and destroy *C. acnes* exposed at the dermal surface. (3) A review of the current literature revealed one randomized clinical trial with 64 patients comparing electrocautery versus scalpel incision in primary anatomic and reverse shoulder arthroplasty. (4) This study demonstrated that using electrocautery for making skin incisions resulted in zero positive bacterial culture at the incised dermal age, compared to 10 patients (31%) with positive cultures – 8 of which were positive for *C. acnes* - in the scalpel group. Despite this, *C. acnes* still appeared in both groups when glove and forceps cultures were taken at later timepoints during the surgery.(4) This perceived transient antibacterial effect of using electrocautery for skin incision without associated wound complications is promising and warrants further research in shoulder arthroplasty. Lastly, while the literature in shoulder arthroplasty is lacking, studies in other surgical disciplines have demonstrated that electrocautery incision can be associated with improved blood loss, improved postoperative pain control, similar infection rates, and similar perceived scar cosmesis.(5,6,7)

References:

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