SH14: Should iodine impregnated drapes be used?

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Response: There is currently insufficient evidence to determine whether iodine impregnated drapes should be used routinely in shoulder arthroplasty.

Strength of recommendation: Limited

Delegate Vote: 49 (100%) agree; 0 disagree; 0 abstain

Rationale: Cutibacterium acnes (C. *acnes*) is the most detected pathogen in shoulder arthroplasty. (1) It's propensity for male subjects is related to the fact that in addition to being found at the dermal surface, it is also present in the sebaceous glands making it challenging for traditional topical skin preparation agents to eradicate. (1) At least one in vivo study has shown that *C. acnes* can repopulate the dermal surface within 60 minutes of skin preparation with traditional agents. (2) Recolonization and delayed migration of skin flora into the wound via direct contact with surgeon's gloves or instruments is thought to contribute to surgical site infections (SSI) and periprosthethic joint infection (PJI). (1) Research is ongoing to identify the ideal combination of skin preparation agents in shoulder arthroplasty, with hydrogen peroxide and benzoyl peroxide being amongst the most promising additive agents. (3,4)

Iodine impregnated drapes are commonly used as an adjunct to further prevent delayed recolonization due to their potential continuous broad-spectrum antimicrobial activity and ability to physically immobilizing bacteria on the skin surface through a conformable drape that allows for limb manipulation during surgery. (5,6) A comprehensive literature review was preformed to identify all studies regarding the use of iodine impregnated drapes in shoulder arthroplasty. Searches involved the terms ("iodine impregnated drape" OR "iodine drape" OR "iodophore drape" OR "incise drape" OR "antimicrobial adhesive drape") 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 iodine impregnated drapes 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 no articles from PubMed (4 found, 0 included) and none from Google Scholar (69 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 iodine impregnated drapes in total knee and total hip arthroplasty.

Based on our review of the literature, there is currently no data to support or refute the routine use of iodine impregnated drapes in shoulder arthroplasty. Although similarly limited, data from knee and hip surgery can be of potential use for consensus recommendations. Rezapoor et al. evaluated the rate of bacterial colonization at different timepoints during hip

preservation surgery in 101 prospectively randomized patients with and without the use of iodine impregnated drapes and found that at the conclusion of the surgery 12% of incisions with iodine drapes and 27.5% of incisions without drape were positive for bacteria. (7) Although none of the patients developed clinical infections, the authors highlight that the probability of SSI is correlated to the quantity of bacteria that reaches the wound raising the possibility that a subsequent PJI could arise had an implant been utilized. (7) In contrast, Chiu et al. compared 120 patients with acute hip fractures randomized to nonmicrobial adhesive drapes versus no drapes and found higher rates of positive wound cultures in the nonmicrobial adhesive drape group (4/55) versus the no drape group (1/65), with no difference in the post-operative infection rates. (8) Furthermore, a retrospective evaluation of 9,774 patients undergoing total hip or total knee arthroplasty over a 12-year period found no significant difference in the rate of PJI when comparing patients who underwent surgery with antimicrobial adhesive drapes versus nonmicrobial adhesive drapes (1.14% versus 1.26%, respectively). (9) Unfortunately, the authors did not report the rate of PJI for patients who underwent surgery without adhesive drapes for additional comparison.

While there is some evidence in the hip and knee literature to suggest that bacterial contamination can be potentially reduced with iodine impregnated drapes, it is important to highlight that positive intraoperative swabs have been shown to not be predictive of PJI in total hip and total knee arthroplasty. (10) Furthermore, no study to date has evaluated the use of iodine impregnate drapes versus no drapes in lower extremity joint arthroplasty and demonstrated a significant difference in clinical infection rates including PJI or SSI. (7) This is because SSI and PJI are relatively rare in joint arthroplasty, and a large sample size would be required to evaluate these effects in a prospective manner. As such, there is currently insufficient evidence to suggest a direct clinical benefit with regards to infection prevention in total joint arthroplasty. Surgeons may choose to utilize incision drapes for other reasons such as added isolation of sterile areas, or for additional stability of drapes during manipulation of the extremity during the surgery.

Citations:

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