

Intra-articular injections and surgical timing

February, 2023

Overview

Intra-articular injections are commonly used as a non-operative treatment option for patients with osteoarthritis of the knee. These therapeutic injections may include corticosteroids, viscosupplementation (hyaluronic acid), and platelet-rich plasma, as examples.¹ Conflicting evidence exists over the safety and timing of corticosteroid or hyaluronic acid injections in the preoperative period due to a potential correlation with post-operative joint infection. Prosthetic joint infection is described as a primary cause of joint failure, with potential for high cost of care due to increased morbidity and mortality.^{2,3} As demand for joint replacement procedures is estimated to increase (approximately 3.5 million knee and 600,000 hip arthroplasties by 2030), understanding methods to prevent this complication is warranted.^{2,4}

Society Guidelines

Guidelines issued in 2021 by the American Academy of Orthopedic Surgeons, stated the following:

- Intra-articular (IA) corticosteroids could provide short-term relief for patients with symptomatic osteoarthritis of the knee.
- Hyaluronic acid intra-articular injection(s) is not recommended for routine use in the treatment of symptomatic osteoarthritis of the knee.⁵

Clinical Evidence

The evidence surrounding intra-articular joint injections is extensive and multifaceted. A sample of the available literature is provided below.

- A systematic review and meta-analysis by Cheek et al. (2021) reviewed 12 studies (4 studies including 209,353 hips and 8 studies including 438,400 knees) to assess the odds of prosthetic joint infection after receiving corticosteroid injections within 12 months prior to hip or knee arthroplasty. Steroid injection in the 12 months prior to surgery significantly increased the odds of infection in hips (OR = 1.17, $p = 0.04$) but not knees. The authors observed a significantly increased odds of infection in both hips (OR = 1.45, $p = 0.002$) and knees (OR = 2.04, $p = 0.04$) if administered within 3 months prior to surgery. Limitations of this study included design of the studies included in the analysis, (i.e. no randomized controlled trials identified) and the potential for publication bias despite author controls.²
- A 2022 meta-analysis by Yang et al. assessed the infection rate after total knee arthroplasty for patients receiving intra-articular injections of hyaluronic acid or corticosteroids. Eight studies were included, consisting of 73,880 in the injection group and 126,187 in the control. The authors noted an overall higher rate of postoperative infection in the injection group when compared to the control (RR 1.16; 95% CI 1.07 to 1.27; $p < 0.001$), and a similarly higher risk of infection if the injection was received in the 3 months prior to surgery (RR 1.26; 95% CI 1.18 to 1.35; $p < 0.001$). There was no significant difference observed between groups at 4 to 6, or 7 to 12 months. Limitations of this study included the inclusion of retrospective cohort studies, a standardized definition of infection between studies, and potential errors in data collected from administrative databases.⁶
- A 2019 study by Richardson et al. sought to differentiate the risk of periprosthetic joint infection based on the type of medication administered (corticosteroid versus hyaluronic acid). A total of 16,656 patients received corticosteroid and 3,249 received hyaluronic acid <1 year prior to total knee arthroplasty. The

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authors noted infection risk for both corticosteroid (OR 1.21; $p=0.014$) and hyaluronic acid (OR 1.55; $p=0.029$) if received ≤ 3 months prior to total knee arthroplasty, with no increased risk if greater than 3 months. No significant difference was observed between medications or total number of injections. Limitations of this study include data errors inherent with the use of large databases.

Physician Advisor Insight

A panel of Orthopedic Surgeons within our HealthTrust Physician Advisor Network offered the following insight with regard to the use of cortisone injections:

- All advisors surveyed indicated they delay joint surgery at least three months after cortisone injections to lower the risk of joint infection due to the immunosuppressive effect of the medication.
- While level one evidence is limited, the general consensus in the literature supports this practice.
- None of the advisors indicated a formal hospital or facility policy related to delaying surgery.

A panel of Orthopedic Surgeons within our HealthTrust Physician Advisor Network offered the following insight with regard to the use of viscosupplementation injections⁹:

- Half of the advisors surveyed indicated that they delay surgery less than 3 months after viscosupplementation (no wait at all to at least a 4 week wait time), while half indicated that they delay surgery a full 3 months.
- Those that stated they did *not* delay surgery indicated limited evidence supporting their position, while those that stated they did delay surgery reported evidence was available to support this practice.
- None of the advisors indicated a formal hospital or facility policy related to delaying surgery.

Summary/Considerations

The evidence surrounding intra-articular joint injections is extensive and multifaceted. Given the complicated burden of prosthetic joint infection, evidence suggests that more research is needed.^{2,7,8}

References

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