



Correlation between corticosteroid injections and surgical site infections in shoulder arthroscopy

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Surgical site infections are a relevant issue in surgery, especially in the orthopedics setting, due to severe implications on clinical outcomes and reduced quality of life (1). Hospitals have developed many protocols to reduce the risk of infections, such as patients' preparation and management during surgery, pre-operative antibiotics protocols, operating theater sterility, and post-operative wound management. World health organization reports that the most common precautions are perioperative oxygenation, maintaining normal body temperature, normovolaemia, adhesive drapes, antimicrobial coated sutures and laminar flow in the operating theater (2).

Previous invasive activities performed on the joint, such as surgery, physical treatments and injection of corticosteroid or anesthetic drugs are considered risk factors for surgical site infection. The correlation between shoulder replacement infection and previous surgery in this joint is supported by many studies. In a large study on patients undergoing shoulder replacement after previous surgery authors reported that the risk of infection after primary shoulder arthroplasty is significantly higher in patients with a history of prior surgery in the same joint. Authors recommend to discuss this risk with the patients before their surgery and to identify at-risk patients (3). Also, corticosteroid drugs are considered a risk factor for infection after surgery, due to the immune local effect

of these medications. This aspect is often considered in degenerative arthritic joints in case of total replacement, with conflicting consideration available in the literature. The influence of corticosteroid injections as a risk factor for patients undergoing tendons repair, like rotator cuff tears repair, is a less discussed topic but has a large interest due to the number of procedures performed each year worldwide.

In an interesting retrospective study, Forsythe *et al.* determined if there was a temporal relationship between corticosteroid injections and the risk of surgical site infection after arthroscopic rotator cuff repair (4). The study aimed to evaluate if there was an increase in surgical site contamination in patients with a history of joint corticosteroid injection when compared to patients without any kind of treatment. Authors also studied if the time between injection and surgery can be considered a relevant aspect for stratifying the risk of post-operative infection in patients undergoing surgery for cuff tear repair. Patients were selected from a large database using specific codes for pathologies and after application of inclusion and exclusion criteria, 12,060 patients with previous injections and 48,763 without injections were included. Surgical site infection in patients receiving a shoulder injection was 0.7% compared to 0.8% in a control group. The authors concluded that an increased infection rate can be found in patients who performed injections within 1 month of arthroscopic rotator cuff repair, without relevant

increased risks of infection if the surgical procedure is delayed by 1 month. This was a retrospective study on a large database, without clear information regarding the type and technique of injection. Larger doses of corticosteroid could influence a more significantly tendon healing response and infection rate. Also, the injection technique and type of cuff tear is not described and could somehow influence surgical outcomes. The injection technique with ultrasound could be more accurate, with correct intra-articular or subacromial final localization of the medicine. Large cuff tears make intra-articular and subacromial space one unique chamber, with the effect of corticosteroid in both articular compartments. Also, with these limitations, the manuscript reports data from a very large database, with specific information regarding timing from injection and surgery and clinical outcomes and adds interesting considerations on the specific topic.

Corticosteroid injections are historically a common practice for the management of shoulder pain as bursitis, calcific tendinitis, frozen shoulder and cuff tears (5). In the years growing evidence has been published to show how steroid injections can lead to tendon degeneration and reduce the healing rate after surgical cuff tear repair (6). However, also this data is not confirmed by all available studies in literature, considering that Baverel *et al.* in a clinical study concluded that preoperative corticosteroid injections did not influence clinical scores and re-tear rates, whereas postoperative corticosteroid injections were associated with lower scores and more re-tears (7). In a study by Desai, the authors concluded that no increased risk of revision surgery could be found when one corticosteroid injection was performed in the year before surgery. Authors recommend attention when 2 or more injections are performed, with association with a substantially increased risk of subsequent revision rotator cuff surgery (8). Only small data in the literature are described to analyze the influence of corticosteroid on surgical site infection and this lack of data is impressive considering the large number of patients undergoing surgery after this medical treatment. Only in the USA every year are performed more than 270,000 surgical shoulder arthroscopies for cuff tear repair and also a small increase in the incidence of infections could have a large consequence on this population (9). The influence on the infection rate of corticosteroid injection in patients undergoing knee arthroscopies is still debated and few data are available in the literature. In a study on medical insurance database Cancienne *et al.* examined potential association, in knee arthroscopy, of corticosteroid injections with surgical site infections. The authors found an increased risk of surgical site infections in patients who underwent corticosteroid

injections the 4 weeks before surgery. These data are difficult to be compared with the results of Forsythe study, due to the different joint and post-operative use of corticosteroid (10).

Concluding, the Forsythe study adds interesting data to a debated topic as infection risk in patients undergoing surgery after injection of corticosteroid in shoulder cuff tears, supported by information extracted in a large and reproducible database. Conclusion by author that physicians should wait at least 1 month before proceeding with operative management to reduce postoperative infections is useful in clinical practice, also if these data could need support from prospective studies, with the collection of information that is not described, as medicine used and technique of injection. Authors of this commentary find that the topic of the article has real clinical relevance and suggest further studies to evaluate more accurately the risk of infection after corticosteroid injection.

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Footnote

Conflicts of Interest: Both authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/atm.2020.01.25>). Dr. Randelli reports personal fees and other from arthrex, personal fees from heareus, personal fees from J&J, personal fees from LIMA, personal fees from MEDACTA, personal fees from MICROPORT, personal fees from OLYMPUS, personal fees from SMITH AND NEPHEW, personal fees from ZIMMERBIOMET, outside the submitted work. The other author has no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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