

Shoulder Joint Surface Destroyed with Injection of Local Anesthetic

Surgeons have found that reducing pain after shoulder surgery helps speed up recovery. As a result, more aggressive pain control measures are now in use. One of those methods is to inject a local anesthetic (marcaine, lidocaine, bupivacaine) directly into the joint after surgery.

This study shows that the practice of postoperative infusion of marcaine actually contributes to the destruction of the joint surface. The result is a condition called chondrolysis. Chondrolysis is defined as a generalized (all over) loss of the articular (surface) cartilage of the joint.

The fact that the condition is generalized (rather than a local area of cartilage loss) shows that this is more than just a mechanical problem. If it were a suture rubbing away the surface cartilage, then only one or two bare spots would form.

But when the entire surface of the humeral head (round ball of bone at the top of the upper arm) and the inner layer of cartilage in the shoulder socket are missing, then it's time to take a closer look.

In this study, 375 cases of shoulder arthroscopic surgery were reviewed. The procedures ranged from a simple debridement (cleaning the joint of infection, loose tissue, and smoothing rough edges) to repair of torn cartilage (called the labrum), capsular release, and rotator cuff repair.

Chondrolysis as a complication after arthroscopic surgery has been studied before. But this is the largest report of its kind and the first effort to figure out why this problem develops. By looking back at the records of these 375 cases, the authors identified three main risk factors that may be the problem.

Most notably, it looks like injecting a specific numbing agent (marcaine) at a high enough dose (0.5 per cent) is the most significant risk factor. Pain and loss of shoulder motion were the first symptoms reported. The pain began within the first few months after shoulder surgery. In all cases, marcaine was injected into the joint after the procedure.

Anyone who had shoulder surgery without the use of an intra-articular (inside the joint) injection did NOT develop chondrolysis. Likewise, when a lower dose of marcaine (0.25 per cent) or a different drug (e.g., lidocaine) was used there were no reports of chondrolysis.

A couple other factors were identified as increasing the risk of chondrolysis after intra-articular injection of marcaine. The use of suture anchors in the glenoid (shallow groove, shoulder socket) was one risk factor.

Younger patients were also more likely to develop chondrolysis after intra-articular injection of marcaine following arthroscopic shoulder surgery. The link between age and chondrolysis isn't clear.

Local anesthetics like lidocaine, bupivacaine, and marcaine are known to destroy chondrocytes (cartilage cells) in animal studies. The cytotoxic (cell killing) effects may be more common in younger age groups but more study is needed to find out what's really happening. The fact that there were fewer cases of chondrolysis with lidocaine may suggest lidocaine is a less toxic agent.

Now that we know 0.5 per cent marcaine injected into the joint after shoulder surgery can lead to joint surface destruction, it may be possible to prevent chondrolysis as a complication of arthroscopic procedures.

Avoiding postoperative infusion of this drug (or using a lower dose) may be all that's required but there may also be other combinations of risk factors at work, too. If that's the case, then further research is needed to find out which risk factors and combinations of risk factors are significant.

Reference: Brett P. Wiater, MD, et al. Risk Factors for Chondrolysis of the Glenohumeral Joint. In The Journal of Bone and Joint Surgery. April 2011. Vol. 93. No. 7. Pp. 615-623.