Clavicle Fractures in Cyclists

The Choice: Surgical or Non-Surgical Treatment

By Dr. Kevin Shea, Intermountain Orthopaedics, Boise, Idaho

The treatment for clavicle fractures continues to evolve in the United States and Europe. For the past 50 years, most clavicle fractures have been managed without surgery. Some recent research, however, has suggested the operative treatment of clavicle fractures may be beneficial in some patient populations. Clavicle fractures are common, representing about four percent of fractures. In the cycling community, the percentage of clavicle fractures is probably much higher.

In the summer of 1996, I was working in Europe and attended a discussion on the treatment of clavicle fractures. I was surprised how many patients in Europe were treated with surgery, compared with patients in the United States. The European surgeons used surgical implants to fix clavicle fractures in young males, as this allowed them to get back to work sooner. This was especially important for factory workers. One of the surgeons remarked that it was less expensive to fix the clavicle and get the individual back to work, compared with the non-surgical expense of a longer rehab and recovery time and disability payments.

In North America, there has been a significant trend toward treating clavicle fractures in young males with surgery. This is based on recent clinical research studies, and the development of specially designed surgical implants to treat clavicle fractures.

In 2007, a major study by the Canadian Trauma Association demonstrated that the results of surgery were better than non-surgical treatment. This study was well designed to reduce research bias, and the conclusions of the study seem valid. For the patients that had surgery, the rate of fracture healing was higher, and the average time for healing was 16 weeks. For the patients that did not undergo surgery, healing took an average of 28 weeks.

In some cases, fractures do not heal, either with or without surgery. This is defined as a fracture "non-union". In this study, the rate of non-union was higher in those that did not have surgery. At one-year follow-up, those that had surgery were more satisfied with the appearance of the shoulder than those that did not have surgery.

For many years, European cyclists have been treated with surgery to repair the clavicles, as this has allowed them to resume training earlier. Many cyclists will get back on their trainers within a week or so of the surgery, and may even ride outside within four-six weeks.

Lance Armstrong had surgery on his clavicle in early 2009, and was able to resume training and racing less than six weeks after his operation. While his fracture may not have been completely healed by the time he returned to active racing, he may have had enough healing to train without

significant pain. Going back to racing/training this soon has some risks, as another fall could re-break the clavicle before it has healed.

Surgical and non-surgical treatments for clavicle fractures have advantages and disadvantages, and any cyclist with such an injury should consider their options carefully. Each patient is different, and the treatment options should be adjusted to different patient factors and preferences.

Non-Surgical Treatment

This takes longer for healing and has a higher rate of non-union and mal-union (the fracture may heal in a less than ideal position, which may have some impact on shoulder function). For cyclists, it may take longer to resume training on either a trainer, or on the bike outside. But, there are not surgical risks, scars or complications with non-surgical treatment. However, there may be a bump or deformity over the fracture site.

Surgical Treatment

Healing is quicker, and the non-union rate is lower. The cyclist may be able to return to training and cycling earlier. But, surgical complications exist, including infection, anesthesia problems, hardware failure, and potential need for surgery to remove the hardware in the future.

Surgical Options

Different types of surgical implants exist, including plates and screws, and intra-medullary devices. These devices fit in the hollow canal in the center of the bone.

Plates and screws are placed on the surface of the clavicle. For fractures that require the most stability, this may be the ideal treatment. These devices do require larger incisions. In individuals with low body fat, the plate will be palpable below the skin. This is not a problem for most people. The plates may require removal in the future. Figure 1 (plate fixation of clavicle fracture).

Intra-medullary devices also are used. These devices may not offer as much initial stability, especially in more complex fractures, but they can be placed with smaller incisions. Removing these devises also can be easier, with smaller surgical incisions. Figure 2 (intra-medullary fixation for clavicle fracture)

The advantages and disadvantages for non-surgical and surgical treatment of clavicle fractures for cyclists:

Factors To consider	Non-Surgical Treatment	Surgical Treatment
Time for Healing	Longer – average 28 weeks	Shorter – average 16 weeks
Impact on shoulder function	Displaced fractures may heal with significant shortening, which may have an impact on shoulder position and function	
Non-union risk (fracture does not heal)	Higher	Lower
Cosmetic Issues	May have large lump or deformity in clavicle	Surgical Scar. In lean cyclists, the hardware may be slightly prominent
Skin Sensation	No significant changes in sensation	Numbness below the incision
Infection Risk	None	Most implant surgeries have an infection risk of approximately 1%, even with appropriate preoperative antibiotic use.
Nerve/blood vessel/lung injury risk	Very Rare	Rare
Impact on Training	Riding a bike places significant loads upon the arm and shoulder, and the discomfort from the fracture may delay return to training	Usually allows earlier return to training. Resumption of training on a trainer or exercise bike can resume in a few weeks or shorter, after surgery.

The decision to have clavicle fracture surgery is a major decision. You should consider your options carefully. Additional research will be necessary to confirm which patient groups are best treated with clavicle fracture surgery as opposed to non-operative treatment.