

ORIGINAL ARTICLE

Benefits and risks of using local anaesthetic for pain relief to allow early return to play in professional football

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Objective: To investigate the risks and benefits of the use of local anaesthetic in a descriptive case series from three professional football (rugby league and Australian football) teams.

Methods: Cases of local anaesthetic use (both injection and topical routes) and complications over a six year period were recorded. Complications were assessed using clinical presentation and also by recording all cases of surgery, incidences of players missing games or leaving the field through injury, and causes of player retirement.

Results: There were 268 injuries for which local anaesthetic was used to allow early return to play. There were 11 minor and six major complications, although none of these were catastrophic or career ending. About 10% of players taking the field did so with the assistance of local anaesthetic. This rate should be considered in isolation and not seen to reflect standard practice by team doctors.

Conclusions: The use of local anaesthetic in professional football may reduce the rates of players missing matches through injury, but there is the risk of worsening the injury, which should be fully explained to players. A procedure should only be used when both the doctor and player consider that the benefits outweigh the risks.

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The use of local anaesthetic in professional football of various codes is widespread, but has not been generally discussed in the medical literature.^{1–6} This discrepancy represents a huge gap in the published sports medicine knowledge base. The major explanation for the non-publication of the use and complications of local anaesthetic injections is that the practice is considered unethical by some medical authorities, including FIMS.⁷ The only major sporting body known to have published guidelines on the use of local anaesthetic is the National Collegiate Athletic Association (NCAA) (guidelines available at www.ncaa.org), although these do not list specific examples and leave the decision at “the discretion of the individual treating physician”.⁸

Various references in non-medical journals can be cited to illustrate potential pitfalls of local anaesthetic injections.^{3, 5, 9–11} These include cases where compensation has been obtained through allegations of medical negligence.

Despite these risks generally being known, the use of local anaesthetic is attractive because it is perceived that the risks are often less than the potential benefits.¹

This paper presents a case series from a single practitioner working as team doctor for a professional football team. It is appreciated that this form of medical presentation is science at one of its lowest levels. It is nevertheless hoped that the study will be the first step towards filling the gap between “real world” practice and published knowledge.

METHODS

The study was conducted over six years. For the first two years (1996 and 1997), I was team doctor to a professional Australian Football League (AFL) team, the Sydney Swans. For the years 1998–2001 inclusive, I was team doctor for a professional National Rugby League (NRL) team, the Sydney Roosters. During 2000 and 2001, I was also the team doctor for the New South Wales (NSW) Rugby League State of Origin team. In the AFL and NRL competitions, teams play one 80 minute match a week.

This case series includes all matches played in the pre-season, regular season, and finals by the first and second

grade teams of the Swans (1996–1997) and Roosters (1998–2001). It also includes the six State of Origin matches played by the NSW team over 2000–2001. These are representative matches (similar to international or “All star” games) that combine players from a number of different club teams.

All documented cases were recorded of local anaesthetic topically applied or injected to reduce pain to allow players to train or play matches with injury. Cases were not included when the anaesthetic was used only to allow a procedure such as suturing of a laceration to be undertaken or was given for pain relief only and the player did not play or train.

The diagnosis, drug used, method and time of administration, and associated complications were all recorded in an injury database. Verbal consent was obtained from the player on every occasion; written consent was not obtained. For State of Origin rugby league matches, consent was also obtained from the club doctor of each player’s regular team.

A major complication was defined as:

- (1) degenerative arthritis of a major joint (knee, ankle, hip, foot joint other than phalangeal, glenohumeral, elbow, first carpometacarpal, or radiocarpal) arising subsequent to intra-articular injection or total block of that joint;
- (2) rupture of a major tendon—for example, Achilles or other foot and ankle tendon, patellar, quadriceps, adductor, proximal hamstring, rotator cuff, distal biceps, distal triceps—while under local block;
- (3) fracture or refracture of a major bone—for example, all bones of lower limb other than phalanges, clavicle, scapula, humerus, scaphoid, radius, and ulna—while under local block;
- (4) rupture of a major ligament—for example, the anterior, posterior, or lateral cruciate ligament of the knee—or dislocation of a major joint—for example, glenohumeral—while under local block;
- (5) inadvertent block of a major motor nerve that prevented a player from being able to play—for example, femoral, obturator, common peroneal, sciatic;
- (6) joint or other subcutaneous infection;

Table 1 Injuries managed with local anaesthetic

Category	Number with painkilling local injections used	Mean number of games using injection per injury	Number where injection was used while a game was in progress	Number with only topical painkiller used	Number with any local painkiller used
Rib injuries	33	3.5	12	9	42
Iliac crest haematomas	32	2.3	24	1	33
Acromioclavicular joint injuries	27	5.7	14	1	28
Finger injuries (digits 2–5)	25	2.4	9	0	25
Thumb injuries	17	4.3	3	2	19
Ankle injuries	21	2.0	6	2	23
Metacarpal injuries	7	2.7	2	0	7
Sternum injuries	6	2.7	3	2	8
Toe phalangeal injuries (digits 2–5)	5	2.4	1	1	6
Prepatellar bursitis	4	2.8	1	1	5
Other injuries	44	2.0	11	28	72
All injuries	221	3.3	86	47	268

(7) damage to an important viscus—for example, pneumothorax where intercostal block was performed;

(8) any injury that was possibly worsened by local anaesthetic use that subsequently required surgery, although if surgery was considered inevitable before the decision to use local anaesthetic and the surgery also subsequently provided a definitive cure, then the complication was considered minor;

(9) any injury that was possibly worsened by local anaesthetic and had a role in limiting the duration of a player's professional football career.

A minor complication was defined as:

(1) degenerative arthritis of a joint not considered above to be a major joint—for example, interphalangeal joint or acromioclavicular joint—arising subsequent to intra-articular injection or total block of that joint, and not requiring surgery;

(2) inadvertent sensory (but not motor) nerve block over a wider range than planned;

(3) failure of the local anaesthetic procedure to block pain enough for the player to participate meaningfully in the game;

(4) any injury that was possibly caused or worsened by local anaesthetic use that caused the player to miss match playing time (but is not listed under major complications) and which eventually fully resolved.

The database was also used to record all cases of players missing games through injury, players leaving the field through injury, players having surgery, and any reasons for players leaving the team at the end of the season. These records were used to help assess whether a player had suffered a complication, as listed above.

RESULTS

The study covered 337 football games (221 Roosters, six NSW State of Origin, 110 Swans). This included 10 NRL finals, four AFL finals, and eight reserve grade finals (four rugby league and four Australian football). During this period, I treated and recorded in an injury database 2851 injuries (1521 for the Roosters, 1256 for the Swans, and 74 for the NSW State of Origin team).

Table 1 details the injuries that were managed with the assistance of local anaesthetic (both topical and injectable).

The average number of players per team per match playing with the aid of local anaesthetic injections was 1.7 in the rugby league games (10.2% of all players) and 1.4 in the Australian football games (6.8%). When topical application of local anaesthetic is considered in addition, the average numbers were 1.9 in the rugby league games (11.1%) and 1.6 in the Australian football games (8.0%). The usual drug used

for painkilling injections was bupivacaine (sometimes administered with a vasoconstrictor agent such as adrenaline, if the injury was not to a peripheral structure such as a finger or toe). The usual drugs used for topical (transdermal) administration were a combination of lignocaine and prilocaine.

The proportion of players taking the field with the aid of local anaesthetic was significantly higher in the rugby league than the Australian football games ($\chi^2 = 15.1$, $p < 0.001$), and was significantly higher in first grade games than reserve grade games ($\chi^2 = 214$, $p < 0.001$). It was significantly higher in finals matches and State of Origin matches than regular season matches ($\chi^2 = 76.2$, $p < 0.001$), and significantly higher in regular season matches than preseason matches ($\chi^2 = 54.9$, $p < 0.001$).

Most injections were given before the start of play. Some injuries were injected on match day acutely, and therefore without the use of imaging or time for the player to reflect on the decision to use local anaesthetic (table 1).

There were six major complications (table 2) and 11 minor complications (table 3).

No player had a career limiting injury associated with local anaesthetic use. Only one player retired from football after playing his last match with the aid of a local anaesthetic. He had anaesthetic injected into his superior tibiofibular joint, which had suffered a grade 2 sprain, for the last four games of the season; he was able to run at training during the week without requiring local anaesthetic. He did not suffer any complication from this injection and the injury fully recovered shortly after the season ended, but he was not offered a contract by any professional team for the following season, and elected to retire.

An injury commonly managed with local anaesthetic that gave rise to two major complications was sprain of the acromioclavicular joint (table 2). Not all such injuries were treated with local anaesthetic, because in some cases either the doctor or the player decided that it should not be used. There was one case in which local anaesthetic was not used, and the player continued to play with an acromioclavicular joint injury and developed osteolysis which required surgical management (distal clavicle resection). Table 4 presents a summary of the management of acromioclavicular joint injuries. Although this is a non-randomised intervention with low power, the relation between the use of local anaesthetic and the development of symptomatic osteolysis appears to be weak ($\chi^2 = 0.24$, $p > 0.6$). There also does not appear to be a strong relation between number of injections used and risk of osteolysis. Of the two cases of osteolysis after local anaesthetic, one player had received 16 local injections, and the other had received only two. One player who received 24 local

Table 2 Major complications of the use of local anaesthetic to allow early return to play

Injury	Complication
Acromioclavicular joint sprain (2)	Distal clavicle osteolysis (2). In both cases this complication was somewhat expected and the two players were able to delay surgery until the end of the season. Both made a full recovery. (Major complication no 8)
Chronic insertional Achilles tendinopathy	Partial rupture of Achilles tendon at anterior portion insertion which required immediate surgery. This complication was expected, with the decision to attempt a local block made on the eve of finals. The player was able to return to play the following season after successful surgery. (Major complication no 2)
Adductor longus tendon partial tear	This was an acute contact mechanism injury. Local anaesthetic was used to enable the player to play two games in a finals series. The player developed chronic adductor tendinopathy and missed eight games the following season, although eventually made a full recovery. (Major complication no 8)
Prepatellar bursitis	Mild prepatellar bursa infection 2 days after game, which was successfully treated by aspiration and oral antibiotics. The player was able to return to play the following weekend without local anaesthetic injection. Of further note is that 2 weeks later, he suffered a partial tear of the quadriceps tendon in the same knee. This was a contact mechanism injury and he was not injected for that game. He missed 5 weeks with this injury but did not require surgery and made a full recovery. (Major complication no 6)
Scapholunate ligament tear	This was an early season injury diagnosed as being likely to require surgery. The player elected to play the remainder of the season and delay surgery. Local anaesthetic was used for three of these games during the remainder of the season, but was not used in 21 games. After surgery (wrist reconstruction) he made a full functional recovery. It is possible that he may suffer late degenerative changes related to this injury. (Major complication no 8)

Table 3 Minor complications of the use of local anaesthetic to allow early return to play

Injury	Complication
Posterior ankle impingement	Medial plantar nerve sensory block; player able to keep playing with numb sole of foot
Fractured 1st metacarpal	Slight malunion with loss of full thumb span (anticipated and expected by player)
Posterior rib fractures	Failed block; player could not take field for that game although successfully played with local anaesthetic the following week
Sternoclavicular joint sprain	Injury was worsened by a further contact mechanism injury; as a result the player needed to miss four games
Comminuted intra-articular fractured base of 1st proximal phalanx	Osteoarthritis of 1st metacarpophalangeal joint (that was eventually almost asymptomatic), a complication considered inevitable after the initial fracture but may have been worsened by playing for 6 weeks with thumb blocks. The injury could not be treated surgically and the alternative treatment was plaster immobilisation, which probably would not have prevented degenerative arthritis
Posterior ankle impingement	Player elected to have surgery to remove os trigonum after playing one game with the assistance of local injection
Bruised iliac crest (3)	Lateral femoral cutaneous nerve block (3)
Lateral ankle sprain	Pericapsular injection causing superficial peroneal nerve block; player was able to play with numb dorsum of foot
Chronic plantar fasciitis	Player ruptured his plantar fascia origin but was able to complete the game. He missed 2 weeks after this but believed that this complication "cured" his injury.

Table 4 Risk of developing osteolysis of the distal clavicle after acromioclavicular (A/C) joint injury

	Number of injuries	Total games missed from these injuries	Number of cases requiring distal clavicle resection at end of season
A/C joint injuries treated with local anaesthetic injections	28	16	2
A/C joint injuries not treated with local anaesthetic injections	25	18	1
Total A/C joint injuries	53	34	3

injections to the acromioclavicular joint had his symptoms spontaneously resolve at the end of the season without surgery.

A case of chronic plantar fasciitis was the one injury in this series that appeared to be improved by the use of a local anaesthetic injection during a game. In this case, the player described feeling a tear while running which was only moderately painful because of the local anaesthetic block. The next morning, the pain he usually felt during his first step had disappeared, but was replaced by a dull ache when running; this lasted for three weeks, after which he became almost completely symptom free. In this case, I believe that the original pain arose from a chronic tightness of the plantar fascia, and that a rupture of the fascia at the region of tightness occurred and effectively "cured" the original condition.

DISCUSSION

The use of local anaesthetic may allow players to return to sport at an earlier stage. This may have enormous benefits for

players of a professional sport.¹ This study shows that such procedures are not without risk, but that these risks may be acceptable for both the player and the doctor.

Only one previous study in rugby league has looked at the use of local anaesthetic injections.¹² In this study, five injuries (three acromioclavicular joint sprains, one rib fracture, and one groin tendon tear) over three seasons were managed in this way. Although these are similar injuries to those presented in this study, the use of painkilling injections was far less common. The rate of use of these procedures in other teams in the past or present cannot be assumed by the rates presented in this study. It is known that local anaesthetic injections have been used in professional rugby league in Australia since at least 1975, when a famous incident occurred during the Grand Final: a player was unable to kick because of inadvertent motor nerve block.¹³ It is worth noting that in all six seasons presented in this study, the first grade team played in the finals series and was a premiership contender. The motivation for the players to return to the field early was

Table 5 Injuries for which local anaesthetic could be used in professional football with routine caution—that is, where the benefits will usually outweigh the risks

Injury	Notes
Acromioclavicular joint sprain	Block is usually very successful. There may be an increased risk of needing distal clavicle resection at end of season, which is not usually a significant threat to a player's career
Phalangeal injuries (toes and fingers) and metacarpals 2–5	Block is easy to perform. Vasoconstrictors should not be used. Some injuries may lead to degenerative arthritis of interphalangeal joints, although in most cases this is acceptable to a professional footballer. The major factors to assess are loss of range of motion and whether the player has any pursuit outside football that involves fine use of the hands, such as playing a musical instrument
Rib and sternum injuries	Block is usually successful when rib injuries are lateral or posterior. Sternum, sternoclavicular joint, and anterior injuries to high ribs are very hard to block adequately. Pneumothorax is a possible complication, but usually occurs in conjunction with acute injury
Bruised iliac crest	Block usually provides major relief from this very painful but self resolving injury. The only common complication is sensory nerve block (lateral femoral cutaneous nerve)
Chronic plantar fasciitis	Injection is very painful. Rupture of the plantar fascia origin is likely but this may, in fact, “cure” the chronic condition

Table 6 Examples of injuries for which local anaesthetic should only be used in professional football, with extra caution, when the rewards are very high (as risks are also high)

Injury	Notes
Ankle sprains	MRI scan is indicated to assess the state of articular cartilage, and injection (even extra-articular) is best avoided if there is any significant articular damage
Tendon injuries	Tendon ruptures are likely when a local block is performed to relieve pain arising from the tendon. In certain circumstances (particularly tendons with many agonists) this risk may be acceptable
Prepatellar and olecranon bursa	Infection is a likely complication of injection of these bursae. In the case of prepatellar bursa (or any other extra-articular knee injury), documentation should be made, perhaps with a witness, to specifically note that the injection was extra-articular, in case the player suffers a serious knee injury during the game
First metacarpal and radiocarpal injuries	The thumb and wrist are more critical hand structures and degenerative conditions should not be accepted lightly in these regions. Scaphoid fractures should always be excluded as this is a common missed diagnosis that on occasion cannot be cured surgically

therefore probably higher than for teams not so competitively placed, particularly towards the end of the season.¹⁴

The players that were injected with local anaesthetic to play State of Origin games came from eight different club teams, and in all cases the club doctor for these teams approved the use of injection. In some cases, the players were already being injected to play with injury at club level. State of Origin matches are the most important games of the season for the players involved, so the benefits of local injections are very high.

In this case series, local anaesthetic was used more often in rugby league than Australian football. This probably reflects the relative injury profiles of the two sports. Contact mechanism injuries that have a good prognosis for spontaneous healing but are very painful in the short term are the injuries that are most amenable to the use of local anaesthetic. Injuries of this type are more common in rugby league than Australian football (which in contrast has more non-contact lower limb injuries).¹⁵ In both of these sports, the use of local anaesthetic is made more practical by the scheduling of only one match per team per week. The nature of any individual sport and player position within a sport should be considered for each individual injury. For example, overhead throwing is not used in either rugby league or Australian football, which makes acromioclavicular joint degeneration a less serious complication than in an American football quarterback, for example.

A retired NFL team doctor recently claimed that local anaesthetic use is common in the NFL.¹⁴ He used local injections for “painful contusions, bruised or cracked ribs, intercostal muscle tears, fractured or dislocated fingers, hip pointers and isolated shin contusions”, but claimed to never use the procedure for a “muscle pull” or inside the knee or ankle joint.¹⁴ Another recent anecdotal review of this topic quoted another practising NFL team doctor as saying that

“blocking an acromioclavicular joint or injecting a rib injury is reasonable at the professional level, not dangerous, and done routinely”.⁸

On the basis of cases presented in this paper and references cited above, tables 5 and 6 present a list of examples of injuries for which local anaesthetic injections could be considered under routine (where benefits will usually outweigh risks) and extreme (where risks are high) circumstances respectively. Injuries to finger and acromioclavicular joint when managed with local anaesthetic may be more likely to lead to degenerative changes, although these changes are common in football players even when these procedures are not used. Degenerative arthritis of the knee and hip are also common in professional football players.^{16–18} Although these conditions (hip and knee degeneration) are far more disabling than degenerative arthritis of a finger joint or acromioclavicular joint, professional football players still knowingly accept these risks when playing.¹

The findings and conclusions of this study should not be seen as being definitive or representative of any group of doctors, as the numbers of cases described are too few to present an exhaustive profile of the risks. Guidelines for anaesthetic use in professional football are almost non-existent because of “lack of scientific evidence”.⁸ This situation can only be remedied by publication of clinical case series (such as this), followed by larger controlled studies with long term follow up.

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Take home message

Local anaesthetic for pain relief can be used for certain injuries in professional football, although complications can be expected. The procedure may be justified when benefits outweigh the risks.

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