Two cases of biceps injury in bodybuilders with initially misleading presentation

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Two cases are reported of biceps injuries in body builders. In both cases the mechanism of injury is either unclear or initially misleading. One case went on to develop necrotising fasciitis, requiring extensive debridement after an initial diagnosis of a biceps haematoma. This report emphasises the difficulties inherent in differentiating necrotising and non-necrotising infections in the emergency department setting and highlights a subgroup of patients who may be at particular risk of delayed diagnosis.

Soft tissue injuries form a large portion of the workload in the emergency department setting. Difficulties arise in attempting to differentiate simple soft tissue injuries from other infective causes.

Necrotising fasciitis is a fulminant disease that can present initially as a benign soft tissue injury. Unfortunately the most common cause of mortality is the delay from presentation to definitive treatment because of diagnostic error.[1 2]

By the nature of the sport, bodybuilders are prone to muscle sprains and tears and may present to the emergency department for initial treatment.

Unfortunately soft tissue infections including necrotising fasciitis are well documented in the body building community secondary to drug injection.[5 6] This report reinforces the need for vigilance in assessing these injuries at initial presentation in this specific group of patients.

CASE REPORT 1

A 26 year old man attended the emergency department complaining of pain in his right biceps. He was a keen bodybuilder and had been training four days before attending. He had awakened the next day with a severe pain in his biceps, which he put down initially to a muscle tear; however, the pain had not eased.

Examination revealed a well developed biceps, with a hot tender mass overlying the belly of the muscle. The patient was systemically well. The diagnosis was of a tear to the belly of the biceps with haematoma formation; treatment was with ice packs, pain relief, and a referral to physiotherapy.

The patient re-presented as a self referral four days later with what now was an obviously infected biceps with necrotic overlying skin and brawny erythema tracking to the axilla and pectoral area. He had experienced increasing pain in the arm and only presented again when the skin changes became obvious. He felt cold, shivery, and nauseated. His temperature was 37.9°C and the pulse rate 100/min. The white cell count was 19×10^6. A diagnosis of soft tissue infection with abscess formation was made, the patient was given intravenous cefuroxime and metronidazole. At this point the patient was asked specifically about corticosteroid use or the possibility of penetrating injury or injection in the infected area. However, this was denied.

Incision and drainage the same evening by the on call surgical team revealed necrotic overlying skin, fascia, and biceps muscle, all of which was debrided down to healthy tissue. Pus from the wound grew β haemolytic streptococcus group F, and bacteroides. On the advice of the resident bacteriologist, the patient was given intravenous benzylpenicillin, clindamycin, ciproxin, and metronidazole.

After the initial debridement the patients condition continued to deteriorate with infection advancing to the axilla and anterior chest wall. At this point the patient was transferred for tertiary care at the regional plastic surgery service.

There, he underwent extensive debridement of the biceps and pectoralis muscles, the infective process extended down onto the axillary vessels and the brachial plexus. After successful control of the infection a large skin defect was grafted.

Ongoing problems include neurogenic forearm pain for which the patient attends the pain clinic and scar contractures for which further procedures are planned.

CASE REPORT 2

A 35 year old man presented to the emergency department complaining of pain and swelling in his right biceps for two weeks, which had gradually got worse; he complained of feeling unwell and felt shivery . He was an enthusiastic body builder and initially the pain had started after weight training.

On examination he had a tense, red tender swelling over the belly of his biceps, which was painful to move. Axillary lymphadenopathy was present ipsilaterally. The temperature was raised at 38.4°C and the pulse rate was 90/min. Investigations included a raised white blood cell count at 12.89×10^6 and an erythrocyte sedimentation rate of 50 mm 1st h. The provisional diagnosis was of soft tissue infection and the patient was admitted for intravenous antibiotics.

Further discussion led to the admission that he had actually injected a mixture of fatty acids intramuscularly into his biceps in the belief that this would stimulate muscle growth. He also admitted that he was a regular user of anabolic steroids, both orally and intramuscularly. His wish was to keep these revelations confidential as he feared for the possible repercussions both professionally and from his sports governing body.

He was admitted under the care of the surgical team, and given intravenous flucloxacillin and benzylpenicillin. Ultrasound examination did not reveal any collection in the biceps and confirmed the patency of the axillary vein. Blood cultures performed on admission revealed no growth. The infection settled uneventfully and he was discharged after seven days, without complications.

DISCUSSION

Simple soft tissue injuries account for a large proportion of the day to day workload of an emergency department. Nevertheless the above cases highlight the diagnostic pitfalls for the unwary. Mortality for necrotising fasciitis has been observed to be 26%–29%. Delay in definitive treatment because of failure to recognise and diagnose the condition at first presentation is the most common cause of mortality.[1 2] Where there is a history of trauma (often non-penetrating) the initial diagnosis is often that of muscle strain/tear.[1 2]

There is a paucity of signs distinguishing necrotising fasciitis from non-necrotising soft tissue infection or inflammation.

Patients complain of pain, erythema, and swelling in both cases, but tense oedema and/or bullae or skin necrosis are reported as diagnostic for necrotising fasciitis.[1 2] Causes of acute biceps pain and swelling include muscle tear with haematoma formation and axillary vein thrombosis, however, distinguishing these conditions from soft tissue infection is difficult and in some cases may be impossible.[2] It is obvious that a high index of suspicion must be maintained at all times.

If necrotising fasciitis is suspected clinically in the emergency department, investigation should be secondary to urgent surgical referral with a view to debridement along with appropriate antibiotic cover.

Although a literature search produced few cases arising spontaneously, soft tissue infection, including necrotising fasciitis, is well documented in body builders using intramuscular injections.[3 4]

For the following reasons, the above cases highlight bodybuilders as a subgroup of the population vulnerable to soft tissue infections.

Evidence exists that corticosteroid use is widespread and is significantly under reported,[9 10] but over one million people in the United States are estimated to be current or past users of anabolic steroids with 50% of these injecting intramuscularly.[5 6] Other substances injected include insulin, growth hormone, diuretics, and fatty acid preparations.[9]

The sharing of needles, combined with poor and unhygenic injection techniques creates the ideal circumstances for infecting organisms to flourish and pass from user to user.[6]

Corticosteroid use in both the general population and bodybuilders has been shown to alter the immune response and could therefore contribute to the development of soft tissue infections including necrotising fasciitis.[7 8]

Finally, compounding the problem is the culture of illicit drug misuse among bodybuilders. Fear of sanction from such sources as the police, work, or sporting governing bodies results in under reporting of the use of performance enhancing drugs, and leads to attempts to disguise the true mechanism of injury.[9 10]

Inevitably this can lead to both delay in presentation and subsequent diagnostic confusion, resulting in serious long term complications, particularly highlighted in case 1.

SUMMARY

Soft tissue infections from self injecting corticosteroids have been well documented in the body building community, as have necrotising fasciitis resulting from intramuscular and intravenous injections.

The above cases illustrate the pitfalls in the diagnosis and treatment of a very select group of patients and emphasises the need for a high index of suspicion for an infective process in what seem, initially, to be simple muscle tears.

The cases also highlight the need for a frank (and confidential) discussion with the patient about his training habits and methods; doing so may avoid delay in the detection and treatment of potentially life threatening soft tissue infections.

Contributors

Fergal Dunn was the author of the paper. Dr E L Dowey advised in the writing of the paper. Dr E L Dowey, Consultant in A&E medicine, Belfast City Hospital is the guarantor of the paper.

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