

Case Report

## Thorn injury mimicking a septic arthritis of the knee.

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### INTRODUCTION

An 8 year old boy was admitted via the accident and emergency (A&E) department with a painful swollen right knee. He described sustaining an injury to the knee some four hours previously when he had crawled under a tree and knelt on a sharp twig, which pierced his trousers and the soft tissues of his right knee. He described also removing the offending twig from his knee.

On examination in the A&E department he had a swollen, generally tender right knee with decreased range of movement. There was a large effusion with a positive patellar tap. There was also evidence of a small puncture wound in the superomedial aspect of his right knee. He was afebrile (36.2°C) and systemically well. The knee was aspirated under aseptic technique, and 8ml of turbid fluid was sampled. This was sent for direct microscopy and Gram stain as well as for culture for organisms and sensitivities, which ultimately failed to show the presence of organisms. Routine blood testing revealed Haemoglobin of 11.6g/dL, White Cell Count of  $14.5 \times 10^3/\text{mL}$ , and significantly, a normal C-reactive protein (CRP) level of  $<5\text{mg/L}$ . The possibility of a septic arthritis was raised, but it was felt that on balance, given the clinical condition of the patient, the rapid onset of the effusion, his temperature, routine laboratory results and the results of the aspirate direct microscopy and Gram stain, this diagnosis was less likely. The patient was commenced on intravenous co-amoxiclav and admitted to the ward for observation.

Overnight the patients' symptoms failed to settle and the following day he underwent arthrotomy and washout of his right knee under general anaesthetic. The incision included

the puncture wound and followed the track made by the plant material into the joint. Upon opening the joint there was further turbid fluid which was swabbed and sent for culture. Careful examination of the joint revealed a small piece of thorn within the joint, which was removed (fig 1). The knee joint was thoroughly washed out and closed in layers. Post-operative recovery was unremarkable. The patient was discharged home two days later on oral antibiotics.

The direct microscopy from the original aspirate revealed 3+ pus cells, occasional epithelial cells, and no organisms and the bacteriological culture yielded no growth after 48 hours. The swab taken at arthrotomy also failed to show any growth at 48 hours.

### DISCUSSION

Thorn injury to joints is uncommon, but should be thought of in cases of acute monoarticular arthritis. In this case, the most salient feature of the history was that of a penetrating injury to the knee with plant material, which was readily volunteered by the patient, but is often overlooked. Additionally, the patient had removed the twig at the time of his injury, however removal had been incomplete, leaving a small piece of plant material behind. Also of worthy consideration was the rapid onset of symptoms from the time of injury (less than four hours). In a case of this type, where a history of penetrating injury is present, then arthroscopic washout or formal arthrotomy is mandatory since there are numerous examples in the literature of cases of recurrent episodes of isolated joint sepsis/synovitis. Washout of a joint but leaving plant material behind is likely to cause recurrent symptoms which can result in multiple presentations and ultimately require extensive treatments including synovectomy.

Foreign body synovitis may simulate an acute septic arthritis<sup>1</sup>. A history of penetrating injury to a joint may not be readily forthcoming, or may be overlooked in the history taking with consequences for long-term sequelae.

In cases of missed diagnosis, the typical presentation may often be of a transient synovitis followed by a relatively asymptomatic period and later by a chronic arthritis long after the thorn injury has been forgotten. In one report a 14 year old boy admitted to hospital 6 weeks after a palm tree injury was shown to have a foreign body on ultrasound scan (USS), with treatment subsequently including repeated arthrotomies<sup>2</sup>.



Fig 1. Foreign body removed from knee joint at arthrotomy, measuring approximately 2.5mm.

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Suspicion of, or history of thorn injury around a joint should be treated by thorough washout of joint and inspection of the joint (with removal of any foreign body), which may be via arthroscopy or arthrotomy. Arthroscopy in theory affords the best view with lower morbidity compared with arthrotomy<sup>3,4</sup>. Although much of the published work comparing arthrotomy with arthroscopy in children is condition specific (for example septic arthritis, osteochondritis desiccans, diagnostic)<sup>5</sup>, there is overwhelming evidence in the current literature favouring arthroscopy over arthrotomy. Potential disadvantages of arthroscopy of the knee include the increased technical demands and the small risk of damage to the articular surface. Additionally, the operating time of the procedure will be increased with arthroscopy<sup>5</sup>. However, numerous published studies have shown clearly that there is decreased morbidity with improved outcomes, as well as better visualisation of the joint using arthroscopy over arthrotomy in cases of both plant thorn injuries and true septic arthritis. Effective early treatment can also be achieved with the arthroscopic route<sup>3</sup>. A further consideration regarding the decision to proceed arthroscopically or via arthrotomy will be surgeon preference and familiarity. Other imaging modalities, such as USS, computed tomography, and magnetic resonance imaging (MRI) may be employed in cases where intra-articular foreign bodies have not been identified. Examples of this type of case may be where there has been a delay in diagnosis or the foreign body is extra-articular<sup>6</sup>. Furthermore, cases have been reported where a plant thorn synovitis was diagnosed after MRI was initially used to exclude other differential diagnoses for example septic arthritis of an elbow joint<sup>7</sup>.

The commonest organism isolated from positive cultures (synovial fluid, blood cultures) is *Pantoea agglomerans*, a gram negative bacterium found in human and animal faeces, as well as plants<sup>8</sup>. It is interesting to note historically that in cases diagnosed as aseptic, the inflammatory response was attributed to plant toxin<sup>9</sup>. It is possible that aseptic cases are in fact *Pantoea agglomerans* septic arthritis with negative cultures. Negative cultures can be due to inappropriate culture media, or inaccuracies in the identification of organisms<sup>2</sup>. Awareness of the possibility of a plant thorn injury should be borne in mind, and if suspected treatment as outlined

above be instigated, to avoid the possibility of long term complications.

### CONCLUSION.

The possibility of penetrating injury with plant material should always be considered and excluded in cases of an apparent rapidly developing effusion, and careful attention to the history of injury must be made. A normal CRP result, as in this case, adds further weight to this differential diagnosis, as it would be considerably elevated in true infection. If an injury of this type is present then the treatment must be formal arthrotomy or arthroscopy and washout since simply washing out the joint but leaving plant material behind may lead to recurrent problems.

The authors have no conflict of interest

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