**CASE REPORT**

*Pantoea agglomerans* as a cause of septic arthritis after palm tree thorn injury; case report and literature review

A Kratz, D Greenberg, Y Barki, E Cohen, M Lifshitz

We report the case of a 14 year old healthy boy, who was admitted six weeks after being injured by a palm tree thorn, with limping caused by pain and swelling in his right knee. An ultrasound examination revealed a foreign body in the posterior lateral aspect of the right knee. *Pantoea agglomerans* was identified in the synovial fluid. The patient underwent two arthrotomies and was treated with amoxicillin-clavulanate intravenously for three weeks. The postoperative course was uneventful, and joint function returned to normal.

A review of the literature between 1953 and 2002 revealed that bacterial growth after plant thorn injuries is reported infrequently. Yet when reported, *Pantoea agglomerans* is the most common organism found. Therefore, it must be considered and suspected in “aseptic” cases of arthritis, when there is a history of a plant thorn injury. We also emphasise the efficacy of ultrasound examination in these cases to identify the presence and location of a plant thorn.

A 14 year old healthy boy was admitted to the hospital with pain and swelling in his right knee. He reported that six weeks prior to admission he had tripped over a palm tree branch and a thorn had penetrated his right knee. At that time, mild swelling and pain had been observed in the area of his right knee, and he had been treated with oral amoxicillin-clavulanate (2 g/day) for 10 days. The swelling and pain resolved. Two days prior to admission, notable swelling and tenderness were observed in the area of his right knee, and he had been treated with oral amoxicillin-clavulanate intravenously for three weeks. The postoperative course was uneventful, and joint function returned to normal.

Physical examination on admission showed an afebrile patient in good condition. His right knee was warm, swollen, and tender. Considerable limitation of active and passive range of motion was noted. Blood leucocyte count was $8.15 \times 10^6$ cells/l with 74% neutrophils. Erythrocyte sedimentation rate was 115 mm/h. Radiographs of the knee showed soft tissue swelling, and no foreign body was detected. An arthrocentesis yielded 80 ml of purulent fluid. Direct microscopic examination of the fluid revealed many leucocytes, but no bacteria. Laboratory examination of the joint fluid showed $92.8 \times 10^6$ leucocytes/l with 86% neutrophils. A radioisotope scan with technetium was performed, showing an increased uptake in soft tissue and in the articular space.

The case was diagnosed as septic arthritis, and empiric treatment with cloxacillin (2 g four times daily) intravenously was started. Growth of a Gram negative bacillus from the joint fluid was detected in the BACTEC Peds Plus F broth (Becton Dickinson, Meylan, France). The final identification of the bacteria by the Vitec system (bioMerieux, Hazelwood, MO) was *Pantoea agglomerans*. Based on the strain susceptibility, treatment was replaced by intravenous amoxicillin-clavulanate (3 g/day). Ultrasound examination of the knee showed fluid accumulated in the suprapatellar bursa, and a foreign body, approximately 8 mm long, in the posterior lateral aspect of the knee (fig 1).

The patient underwent an arthrotomy with joint irrigation, but no foreign body was found. Intravenous antibiotic therapy was continued; the patient remained afebrile, and the swelling decreased, but there was still a limited range of movement and no further clinical improvement. The erythrocyte sedimentation rate was still raised (100 mm/h). A second ultrasound examination showed fragments of the foreign body lateral to the former location. The patient underwent a second arthrotomy. A small pouch, containing pus and surrounded by tiny fragments of thorn, was found and removed. Postoperative ultrasound examination revealed no trace of foreign body remnants. The patient remained hospitalised for one further week. The postoperative course, including a four week follow up examination, was uneventful, and joint function returned to normal.

**DISCUSSION**

Arthritis caused by plant thorn penetration is a well known medical condition, especially among children. It has been described following injuries from thorns of several kinds of plants, including palm, yucca, hawthorn, bougainvillea, sentry plant, blackthorn, cactus, and rose thorn.

The thorn of the date palm (*Phoenix dactylifera*; fig 2) is particularly dangerous as the tip (distal 0.5–1.5 cm; fig 3) dries out much faster than the remaining parts of the thorn, and therefore is prone to break off within the joint, disintegrating into very small particles.

Historically, failure to discover an organism in the joint fluid after a plant thorn injury led to the hypothesis, first published in 1953, that the arthritis or synovitis after these injuries was the result of an allergic reaction, mostly caused by plant toxins, and hence was aseptic. A review of numerous reports of plant thorn arthritis and synovitis published between 1953 and 2002 revealed that reports of organisms found in cultures of joint fluid were very rare, but when reported, *Pantoea agglomerans* was the most common organism (5 of 11 cases; table 1).
Pantoea agglomerans (formerly named Enterobacter agglomerans, and earlier referred to as Erwinia herbicola) is a member of the Enterobacteriaceae. This Gram negative bacterium can be found in human and animal faeces and in plants. The earliest reports of human infections caused by this organism were published in the early 1970s.

The first case of arthritis caused by Pantoea agglomerans was reported in 1978, after a wooden splinter had penetrated a patient’s knee. A similar case of knee arthritis after a blackthorn injury was reported seven years later. In 1991, Olenginski et al reported a series of seven patients suffering from plant thorn synovitis, of which only one case showed a positive joint fluid culture for Pantoea agglomerans. De Champs et al reported two cases of septic monoarthritis caused by Pantoea agglomerans.

In all cases described, as well as in our case, the foreign body was not detected by x-ray examination. In our patient the existence and location of a foreign body was confirmed by ultrasound examination. Most authors note the delay in establishing a correct diagnosis (up to nine months), since the inflammation often develops long after the thorn injury has occurred. On the basis of a review of the literature, the recommended method to achieve complete recovery is arthrotomy and removal of the thorn.

Pantoea agglomerans has an important role in the pathogenesis of plant thorn arthritis after a thorn injury. It seems that many cases of “aseptic” arthritis after a plant thorn injury are actually Pantoea agglomerans septic arthritis. Inappropriate growth media and inaccurate identification methods could be the reason for negative results in culture identification. Therefore, the use of methods capable of recognising Pantoea agglomerans is recommended when a history of any thorn injury exists. An ultrasound or magnetic resonance imaging examination should be used to identify and locate suspected foreign bodies. Removal of the foreign bodies by arthrotomy, combined with antibiotic therapy, seems to be the most effective treatment to achieve complete recovery.

Table 1 Summary of all cases with positive cultures

<table>
<thead>
<tr>
<th>Author</th>
<th>No. of cases reported</th>
<th>No. of positive cultures</th>
<th>Organism identification</th>
</tr>
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<tr>
<td>Flatauer and Khan</td>
<td>1</td>
<td>1</td>
<td>Pantoea agglomerans</td>
</tr>
<tr>
<td>Stromqvist et al</td>
<td>1</td>
<td>1</td>
<td>Pantoea agglomerans</td>
</tr>
<tr>
<td>Olenginski et al</td>
<td>7</td>
<td>1</td>
<td>Pantoea agglomerans</td>
</tr>
<tr>
<td>De Champs et al</td>
<td>2</td>
<td>2</td>
<td>Pantoea agglomerans</td>
</tr>
<tr>
<td>Cahill and King</td>
<td>10</td>
<td>2</td>
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<td></td>
<td></td>
<td></td>
<td>b. Unspecified Enterobacter</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>a. Staphylococcus albus</td>
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<td></td>
<td></td>
<td></td>
<td>b. Gram negative rods</td>
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<td></td>
<td></td>
<td></td>
<td>c. Streptococcus α haemolytic</td>
</tr>
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<td>Sugarman et al</td>
<td>5</td>
<td>3</td>
<td>Nocardia asteroides</td>
</tr>
<tr>
<td>Freberg et al</td>
<td>1</td>
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Figure 2 The date palm (Phoenix dactylifera).

Pantoea agglomerans septic arthritis

Figure 3 The thorn tip of the date palm (0.5–1.5 cm) (black arrows).

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REFERENCES


POSTCARD FROM THE ROAD

The black hole in my CV

When I was in my late twenties I heard myself saying something along the lines of “We can travel around the world when we retire”. Fortunately, as a consequence of the number of daft things I say, I do make an effort to listen to quite a lot of what comes out of my mouth. This particular inanity seemed to me to be, by several orders of magnitude, more stupid than anything I’d said in a long while.

It was shortly before this that I’d got an SpR post, together with an NTN and, out of the blue, a letter telling me the date on which I’d hopefully get my CCST. At this point I’d, theoretically, fall off the conveyor belt into, again hopefully, a consultant job. In this cynical state of mind the consultant job would probably be a bit of a giveaway. In any case, I don’t think I’d characterise these, chiefly, as expense and CV. The same time as spending on travel. I used to say that I could think of no one lying on their death bed and saying, “I’m really pleased we had that new kitchen six months sooner”. I’m more inclined these days to upgrade that estimate to at least 18 months, and throw in a bathroom too. But you shouldn’t confuse recognising an economic fact with regret. I’m entirely happy with this and I consider that the number of things I’ll be able to remember on my death bed—and all the times between here and then—were in fact very reasonably priced.

The CV part of it is tricky. I know a lot of folk who took a year off before entering university, and this is rarely criticised. But taking six months in the middle of a career is seen very differently in some quarters. One senior colleague quietly confided to me a similar—but different—adventure in his early career which was sufficient to make an interviewer comment “You don’t have much staying power, do you?”. Similarly I was advised by one senior academic that for any “serious” career I’d do well to disguise what I’ve come to think of as the black hole. This becomes a bit of a moot point, since this loophole has been closed with the time of writing this.

So, why not hide it? I’d need to list some of the positives—and I’m not sure where to begin. I think I’m a better, more rounded person than that twenty-something spouting rubbish. I think I know more—but see my caveat above about most of what I say is probably rubbish. I’ve spent time as an adult, free from tiredness, work, anxiety, and hassle. To use some clichés: I’ve woken up and smelt the coffee, I’ve stopped and smelt the roses, and I’ve done all this with someone I love.

The question remains, shall I attempt to disguise my CV black hole? This becomes a bit of a moot point, since this postcard—complete with title—would appear in my CV, and would therefore be a bit of a giveaway. In any case, I don’t intend to hide it—in this CV this is almost a way of making sure that I retain the courage of my convictions.

And now I’m going to have another cappuccino, and this, and the thousand other cappuccinos, sunsets, landscapes, temples, smiles, and sights and smells and experiences should be enough to last me until I retire ...

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