Cervical arthropathy caused by gout: stabilisation without decompression

Dushan Thavarajah · Rahim Hussain ·
John L. Martin

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Abstract The cervical spine is a rare site where tophaceous gout has been identified. There are currently 15 described cases in the literature of gouty involvement of the cervical spine with only three cases involving only the atlanto-axial region. We add the fourth of such cases and only the second to be managed operatively.

Keywords Gout · Cervical arthropathy · Atlanto-axial subluxation · Crystal arthropathy

Introduction

The first description of gout was described in 2600 BC when the Egyptians noted gouty arthritis of the big toe [1]. Gout is a disease which can be characterised by elevated uric acid levels as a result of defective purine metabolism and elevated acidity within the blood. It can also result from reduced elimination from the body in cases of renal failure. It can also result from high cell turnover in tumours. As a result of this, acute attacks of arthritis can occur when monosodium urate crystals become deposited on the articular cartilage of joints, tendons and any surrounding soft tissues. This can then become a chronic process whereby large masses of crystals are deposited causing gouty tophi [2].

The commonest sites of involvement for gouty arthritis include the first metatarsophalangeal joint of the big toe, ankle, knee, finger joints and elbow joint [3].

The cervical spine is a rare site where tophaceous gout has been identified. There are currently 15 described cases in the literature of gouty involvement of the cervical spine with only three cases involving only the atlanto-axial region [3–17] (Table 1) [17]. We add the fourth of such cases and only the second to be managed operatively [3]. This is, however, the first case not to be decompressed, and only received stabilisation.

Case

A 57-year-old man with a 17-year progressive history of chronic gout, which affected his joints requiring hip arthroplasty, had become wheel chair bound due to the pain associated with gouty arthropathy. He could not tolerate allopurinol due to a hypersensitivity reaction causing a skin rash, fever and renal dysfunction. He was therefore being managed on Probenecide, a drug that increases uric acid excretion in the urine. His renal function was carefully monitored. Despite medical management for gout, he presented following a 1-year history of worsening neck pain, tingling in his arms and legs, when he sneezed or coughed, and described that he felt that his body could “no longer support his head”. On examination, he had 4/5 MRC power to his upper limb/lower limbs and brisk reflexes throughout. Throughout this time he remained on treatment with Probenecide.

An MRI scan was done, which had shown a large erosion and deposit on the odontoid peg causing thecal compression of the spinal cord. There was reported encroachment at the cervicomedullary junction (Fig. 1).

D. Thavarajah (✉)
Department of Trauma and Orthopaedics, Royal Berkshire
Hospital, London Road, Reading RG1 1AN, UK
e-mail: dushanthavarajah@yahoo.com

R. Hussain · J. L. Martin
Department of Neurosurgery, Morriston Hospital, Morriston,
Swansea SA6 6LZ, USA

Table 1 All reported cases of cervical spine gouty tophi with the symptoms, treatment and follow up

References	Level of involvement	Symptoms, management and outcome
Fraser et al. [17]	C2	Cervical neck pain. Managed with colchicine and allopurinol. Symptoms resolved
Wazir et al. [3]	C1–2	Cervical neck pain and progressive quadraparesis. Managed with decompression and fusion. Neurological improvement post operatively
Cabot et al. [5]	C4–7	Cervical neck pain following a fall. Upper limb weakness and altered sensation. Managed with colchicine and allopurinol. 6-month follow-up demonstrated resolution of pain and weakness
Diaz et al. [6]	C4–5	1-week history of quadraparesis. Anterior decompression/fusion. Moderate clinical improvement from immobility to walking
Yen et al. [16]	C3–6	2-week history with progressive quadraparesis. Anterior microdiscectomies/fusion. Moderate clinical improvement from immobility to walking with a frame
Duprez et al. [7]	C3–5	1-year history of progressive quadraparesis. Poor compliance with gout medication. Anterior corpectomies, foraminotomies and fusion. Mild clinical improvement with partial neurological improvement post surgery
Sabharwal and Gibson [12]	C5–7	Severe neck pain from C5–7 but no neurology with poor compliance to allopurinol and colchicine. Admitted with supervised administration of allopurinol and naproxen. Pain resolved
Van de Laar et al. [14]	Occiput-C3	Spastic gain and reduced pain and vibration sensation from C2. Suspicion of malignancy lead to the diagnosis of gout. Anterior removal of tophi, pharmacological. Treated with Colchicine and allopurinol full resolution of symptoms
Alarcon and Reveille [4]	C6–7	Presented with neck pain. Managed with colchicine and allopurinol with resolution of pain
Jacobs et al. [10]	C1–2, C5–6, C6–7	Presented with a spastic quadraparesis. Managed in a Philadelphia collar because of a subsequent odontoid peg fracture. Regained normal strength with colchicine and allopurinol
Miller and Percy [11]	C5–6, C6–7	Presented with neck pain. Managed with allopurinol. Symptoms resolved
Sequeira et al. [13]	C3–4	5-week history spastic quadraparesis. Biopsy and laminectomy. Improvement noted in the immediate post op period but then lost to follow-up discharged to chronic care hospital
Magid et al. [9]	C1–2, T2, T8–9	C6 radiculopathy, back pain and T6 sensory and motor level 3-week history of becoming immobile. Decompression and Pharmacological. Pain has gone and able to mobilise with assistance treated with allopurinol and colchicine
Vinstein and Cockerill [15]	C3–4	Presented with cervical neck pain and managed with allopurinol. Recovery of symptoms
Kersley et al. [8]	C1–2	Severe neck and throat pain and head instability. Cervical collar, pharmacological. No improvement despite treatment with ACTH with death 3 years after presentation

He then went on to have a CT scan, which was reported as showing the odontoid peg appearing hypodense with amorphous intra-lesional calcification destructive in nature. There was extension to the left side to involve the lateral mass and posterior arch of C1, which looked moth-eaten. There was destruction of the anterior arch of C1 on

the right side, with soft tissue breaching the retropharyngeal fat plane. The peg had become displaced anteriorly away from the inferior body of C2. The soft tissue was compressing the cervicomedullary junction (Fig. 2a, b) He was fitted in a halo brace to prevent any destabilisation.

Fig. 1 Sagittal T2-weighted MRI scan demonstrating thecal compression at the cervicomedullary region

Possible differential diagnosis raised at this stage included rheumatoid pannus, gout, metastasis, myeloma, chondroma, chondrosarcoma and infection. He subsequently had a transoral biopsy that confirmed a diagnosis of gout with urate crystals that were negatively bi-refrinent under polarised light.

It was decided that he would be a good candidate for a C0–C6 occipito-cervical fusion, which was up to level-

C6 to prevent a stress riser from occurring causing further instability through fracture. A decompression was not performed because it was felt that the destructive nature of the gouty tophi, which appeared calcified was encroaching the dura and so inadvertent dural tear due to adhesions was a strong possibility. Therefore, the risks did not outweigh the benefits as a gouty decompression was likely to be critical should this have been done. He was therefore stabilised and managed medically with febuxostat (Fig. 3a, b) He is to date at 1-year follow-up doing very well with no further neck pain. His neurology has partially resolved in that he no longer has neck pain. He does however still have 4+/5 MRC power to all four limbs with some resolution from the initial presentation.

Conclusion

This case and others that have gone before it demonstrate that chronic neck pain and a history of gout should entertain a differential diagnosis of gout. Atlanto-axial subluxation should no longer be synonymous with only rheumatoid arthritis but also tophaceous gout. Once suspicion is raised about atlanto-axial instability management needs to come from temporary stabilisation (halo brace), definitive diagnosis (transoral biopsy) and then definitive treatment (occipito-cervical fusion). Decompression needs to be judged on an individual case by case basis and the authors suggest that a balance of risks versus benefits should be borne in mind when this decision is made. If neurological symptoms are mild to moderate then a stabilisation with medical management would seem appropriate. Calcification and encroachment of the dura could lead to a difficult decompression involving adhesions.

Fig. 2 **a** Sagittal CT scan demonstrating amorphous intralesional calcification at the C1–2 level. **b** Axial CT scan demonstrating amorphous intralesional calcification around the odontoid peg with destruction of C1

Fig. 3 **a** Anterior posterior radiograph following occipito-cervical fusion (C0–C6). **b** Lateral radiograph following occipito-cervical fusion (C0–C6)

Conflict of interest None of the authors has any potential conflict of interest.

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