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http://dx.doi.org/10.1016/j.jocn.2017.06.041

Spontaneous regression of post-traumatic syringomyelia: A case report and literature review

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ARTICLE INFO

Article history:
Received 28 February 2017
Accepted 21 June 2017

Keywords:
Syringomyelia
Spinal cord injury
Post traumatic
Spontaneous resolution

ABSTRACT

Syringomyelia defines a condition in which myelopathy develops secondary to the formation of a cyst or cavity within the spinal cord parenchyma known as a syrinx. Although there is a significant volume of studies analysing the underlying mechanisms behind their formation, the management of such cavities remains an ongoing topic of debate. Aside from conservative approach, a range of surgical options exist, however long term outcomes are poor and a literature search reveals that the overall benefits are questionable. We present a 31-year-old man with an incidental finding of a syrinx on MRI following a traumatic spinal cord injury. Following a decompression and 360° fusion at the C6/7 level for a fracture-dislocation, the patient developed a delayed syrinx (54 mm × 11 mm × 8 mm), and was managed conservatively. Over 2-year follow-up, the volume of the syrinx spontaneously reduced (46 × 5 × 5). Conservative treatment including careful observation is advisable as the first line therapy in patients with a post-traumatic syrinx. Surgery may be indicated in patients with progressive neurological symptoms, however there is a distinct lack of robust evidence on the long-term efficacy of surgery.

1. Introduction

Syringomyelia (SM) defines a condition in which myelopathy develops secondary to the formation of a cyst or cavity within the spinal cord parenchyma known as a syrinx. With an estimated incidence of 9 per 100,000, such cavities are reported to be present in almost a quarter of all spinal injury patients [1]. However according to Schurch et al. [2], only 5% of spinal cord injury patients (n = 449) will be symptomatic of SM [2]. Although patients may experience a range of neurological symptoms including sensory disturbances and weakness, most patients remain symptom-free with the finding of a syrinx incidental during standardised imaging protocols. Other etiological associations include Chiari malformation (type 1), trauma, spinal cord tumours, and infectious adhesive arachnoiditis. The underlying pathophysiology driving the development of a syrinx remains an ongoing topic of neurosurgical research with theories surrounding underlying tissue damage, haematoma formation, and obstruction to CSF flow [3]. Broadly they are subdivided into 3 categories: (1) central canal dilations communicating with the fourth ventricle, (2) non-communicating isolated dilations, and (3) cavities originating in the cord parenchyma outside the central canal [1,4].

Diagnosis and localisation is primarily achieved through magnetic resonance imaging (MRI), which may also be employed as a means of monitoring syrinx characteristics over time [5]. The cavity itself may remain static, resorb, or enlarge with ongoing sequelae persisting for years [6]. Changes to the cavity may also not be symmetrical, and can be impacted upon from minor pressure changes induced from coughing or straining.

Due to the inability of predicting which cavities may worsen, there is no clear consensus regarding the management of a syrinx, particularly those that may be non-functional. Options include operative intervention (deformity correction, decompression, CSF shunting procedures, arachnolysis, cord transection) and non-operative management, though neither option may address the underlying cause. Recommendations in a recent review by Roy et al. [7], were in favour of conservative management in the setting of an idiopathic or traumatic etiology [7]. The major limitation was the lack of studies (n = 17), restricted to short case series. In contrast, another large-scale review of post-traumatic syringomyelia was in favour of surgical intervention on the basis that earlier intervention was associated with slightly improved outcomes [1]. This recommendation is not endorsed in other studies and reviews with no clear indications for surgery outside severe neurological symptoms and progression of neurological deficit [8–10].

In this report, we present a single case of a post-traumatic syrinx finding in a young male following a traumatic cervical spine fracture 3 years prior. He was treated conservatively and monitored for 2 years.

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2. Case

A 31-year-old male suffered C7 fracture with C5/6 and C6/7 ligamentous disruption and T1 ASIA-B Neurological deficit, following a fall from a height 3 years prior requiring a 360° decompression and fusion (Fig. 1). The patient underwent a decompression and combination anterior/posterior cervical fusion from C5-T1, including a corpectomy and iliac crest graft at the C7 level. He was subsequently managed in a subspecialty spinal injuries rehabilitation unit for 4 months. On discharge, he was independent and had recovered significant use of his lower extremities. He was able to mobilize with a forearm support frame. Following the initial spinal injury, the patient continued to experience intermittent leg weakness, paraesthesia and urodynamic troubles, requiring Baclofen (β-γ-aminobutyric acid) therapy that was later self-ceased. The patient continued to follow-up regularly, with fusion radiologically confirmed at 9 months.

He presented for routine follow-up 1 year following his injury. Clinical examination revealed an ASIA-D injury with associated leg weakness, increased from his discharge examination, and the patient reporting a general lack of endurance. The patient also reported sensory changes in the lower limb including, increasing spasticity, and temperature intolerance. Subsequent spinal MRI demonstrated the prior cervico-thoracic injury and associated post-surgical findings, including a syrinx from level C4-7, measuring approximately 54 mm in length with a mean diameter of 10 mm. There was no hydrocephalus, Chiari-1 malformation or other significant abnormalities detected. Following multidisciplinary discussion, the Syrinx was managed conservatively, with ongoing observation.

At 2-year follow-up, the patient reported significant improvement in terms of his endurance, leg weakness, and paraesthesia. Follow up MRI scan (Figs. 2 and 3) revealed a 33% reduction in the volume of the syrinx, measuring 46 mm in length and 5 mm in diameter (both major and minor axis), with no observable canal or foraminal stenosis.

3. Discussion

Our present case is evidence supporting conservative management; with a post-traumatic syrinx spontaneously resorbing throughout a two year follow up period. This coincided with a comparable reduction in the new symptoms experienced by the patient, with recovery ongoing.

The development of the syrinx is most likely post-traumatic, with the history of spinal cord injury, and further presentation over 12 months after initial injury. Past studies have suggested a lag between 3 months and 34 years following cord insult [1,11], with

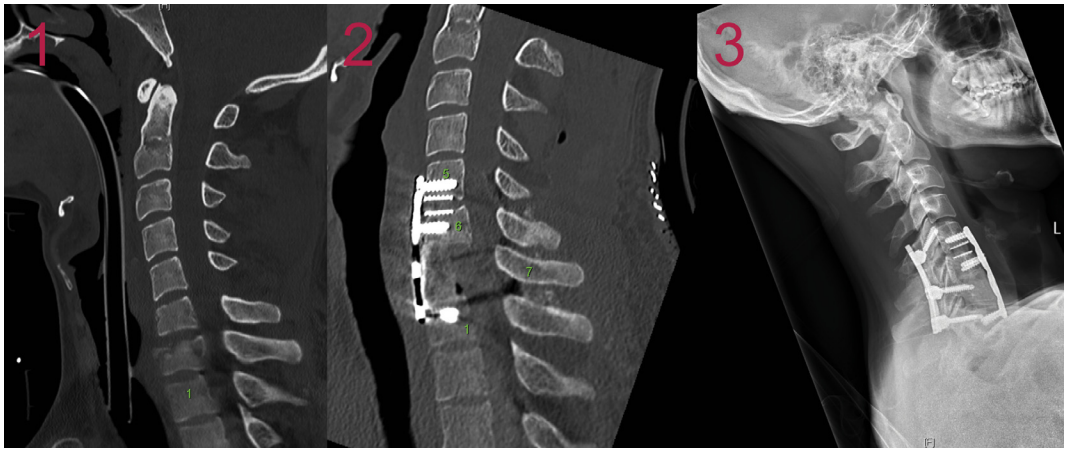

Fig. 1. (1) Initial CT scan (2) post-operative CT scan (3) post-operative Lateral X-ray.

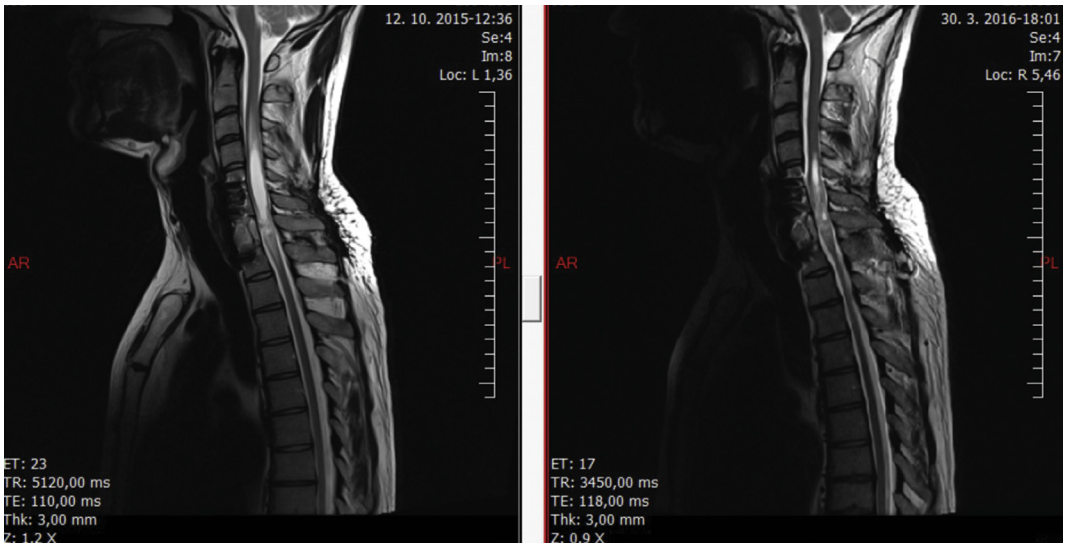

Fig. 2. Sagittal T2 MRI at 1 year post injury (left) and 2 years post injury (right) demonstrating reduction in volume.