Tuberculous infection of the cervical spine

Case report

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A case of severe tuberculous destruction of the cervical spine treated without bone grafting is described.

KEY WORDS tuberculosis cervical spine

Tuberculous infection of the cervical spine may seriously impair spinal stability since extensive destruction of multiple vertebrae usually occurs. Present principles of treatment include antibiotic therapy, debridement of necrotic bone and tissue, and osseous grafting with external stabilization until fusion occurs. This case report presents a successful result in which a potentially unstable tuberculous process was treated without grafting by simple drainage, antibiotic coverage, and external fixation. As in many previously reported spinal cases, neurological findings were few.

Case Report

A 40-year-old Negro woman was transferred to Barnes Hospital on January 15, 1969, for treatment of angulation of the cervical spine. Aside from a 2-week episode of neck pain following a hyperextension injury 3 years before, the patient had been well until 6 months prior to admission. At that time she awoke with severe neck and right shoulder pain. There was marked paresis of all limbs, particularly the lower extremities. She also noted numbness and paresthesia of her hands and feet. Cervical spine films in another hospital were said to have been normal. Paresis resolved over several days although she may have had a second transient episode of quadriparesis on the day prior to discharge.

Following discharge, pain in the neck and right shoulder recurred in a more severe form and began to radiate into the right arm and hand. Four months prior to admission the patient developed dysphagia and occasional choking. A tuberculin skin test by her physician was said to be negative. Radiographs just prior to admission to Barnes Hospital demonstrated complete lysis of the C-3 vertebral body and involvement of the bodies of C-2 and C-4 with angulation at this level. A large retropharyngeal mass was apparent and there was a lytic lesion in the body of T-3. These findings were confirmed subsequently with polytomography (Fig. 1).

Examination. Examination revealed neck stiffness and palpable fullness of the posterior pharynx. The trachea was tender and shifted slightly to the right. Several matted cervical lymph nodes were palpable. The only neurological deficits were slightly decreased perception of touch over the right shoulder and mild right-sided hyperreflexia. Plantar responses were normal, as were radiographs of the chest. There were white cells

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in the urine and an intravenous pyelogram showed some blunting of the right superior calyx. A tuberculin skin test was markedly positive.

Initially, Crutchfield tongs were inserted. Application of 10 lbs of traction substantially reduced the angulation of the cervical spine. A cervical node biopsy revealed caseating granulomata and acid fast organisms. Needle aspiration of the retropharyngeal mass obtained pus containing lymphocytes and polymorphonuclear cells. No organism could be identified with gram or acid fast stains but cultures subsequently grew *Mycobacterium tuberculosis* var. *hominis*.

**Operation.** On January 28, 1969, the retropharyngeal mass was drained under local anesthesia. There was a 5 × 3 cm abscess cavity behind the prevertebral fascia. The cavity wall was biopsied and the abscess emptied of pus, irrigated with streptomycin and bacitracin, and a ½ in. Penrose drain inserted. The patient was treated with paraaminosalicylic acid, isoniazid, streptomycin, and pyridoxine preoperatively and postoperatively. Streptomycin (1 gm) was instilled through the drain for 2 days prior to its removal. Healing was uneventful.

**Postoperative Course.** The patient was maintained in traction with Crutchfield tongs for one month and then placed in a Minerva jacket. On March 9, 1969, she was discharged ambulatory and free of pain. Paraaminosalicylic acid, isoniazid, and pyridoxine were continued for a total of 29 months, at which time she was asymptomatic without neurological abnormality.

Radiographs of the cervical spine repeated at monthly intervals first revealed new bone formation in June 1969. The Minerva jacket was removed at this time and she was maintained in a soft collar. Polytomes on June 16, 1969, after removal of the jacket confirmed the onset of fusion and revealed early healing and remodeling of bone. Radiographs in February 1970 demonstrated further osseous bridging between C-2 and C-4. Follow-up films 11 months postoperatively, in August 1971, revealed complete remineralization of the C-2 and C-4 vertebral bodies with fusion in moderately good alignment without displacement on flexion and extension views (Fig. 2).

**Discussion**

Although the neurological deficit was minimal in this case, tuberculosis of the cervical spine is often associated with quadriparesis. Tuli, *et al.*, 17 observed 7 of 38 patients (19%) and Kuo12 noted 18 of 39 patients (41%) to have quadriparesis. Resolution of the neurological deficit after antibiotic therapy with or without surgery was similar, being observed in 6 of 6 patients by Kuo, *et al*.

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**Fig. 1.** Initial lateral radiograph (A) and polytome (B) before application of Crutchfield tongs. Note prevertebral soft tissue swelling as well as bony destruction and angulation. Arrows indicate posterior aspect of the pharyngeal air shadow.
FIG. 2. Lateral radiograph 31 months after institution of therapy. There is reapproximation of the pharyngeal air shadow (arrows) to the cervical spine, reduction of spinal angulation, bony fusion, and restoration of previously lytic areas in C-2 and C-4.

...al., 12 (debridement and anterior fusion), 7 of 8 patients by Fang, et al., 4 (radical debridement) and 12 of 12 patients by Tuli 16 (antibiotics and simple drainage of abscess if indicated) Whether antituberculous therapy without surgical decompression would be as effective as surgical decompression in cases of epidural abscess is unclear but seems dubious. However, if the neurological deficit is not profound, operative decompression may be safely delayed until failure of conservative treatment is apparent. 16

In our case, neurological findings were minimal at the time of admission and were attributed to bony angulation rather than epidural abscess. Treatment involved external stabilization without removal of the involved bone or placement of an internal bone graft. Only simple drainage of the prevertebral abscess with instillation of antibiotics was performed, leaving the necrotic portions of the vertebrae intact. Drainage of the soft tissue abscess was necessary to promote resolution of the tuberculous process and to relieve partial esophageal obstruction. The importance of drainage prior to healing has been well documented by Swett, et al., 15 although this has been thought to be unnecessary in many instances by some authors. 5, 6

Many authors 5, 6, 7, 12 have advocated that treatment of spinal tuberculosis include debridement of necrotic bone and internal strut grafting. Anterior fusion seems to be favored. Our case illustrates that fusion in satisfactory alignment may be accomplished without grafting when a single vertebral body has been totally lysed. Similarly good results without grafting have been reported by Fang, et al., 1 who observed satisfactory cervical fusion following radical debridement of necrotic tissue in 10 of 12 (83%) cases. This compares favorably with reports of cervical fusion following anterior osseous grafting which was observed in 5 of 5 cases by Fang and Ong 9 and in 8 of 9 cases (89%) by Kuo, et al. 12 Fusion following anterior grafts has been reported in 50 of 85 (59%) 9, 70 of 86 (81%) 12 and 94 of 96 (98%) 7 instances, most of which involved the thoracic and lumbar spine.

Debridement of necrotic bone has proved effective in combination with antituberculous therapy but is not mandatory for resolution of the lesion and adequate bony fusion. It is interesting in this regard that Barclay, et al., 1 and Canetti 16 have found that isoniazid and streptomycin accumulate within areas of caseous necrosis. In our case, bony fusion and resolution of the lesions occurred without resort to debridement of bone. Bony fusion of lesions at various spinal levels has been reported in 55% to 86% of cases treated with debridement of bone. 5, 6, 8, 10, 13, 14 Most of the cases failing to show solid fusion of bone have displayed stable fibrous union.

Satisfactory stabilization of the spine, reversal of neurological deficit and elimination of foci of disease are the major aims of therapy in tuberculosis of the spine. This case and review of the literature suggest that these aims can often be attained with antituberculous therapy and drainage of soft tissue abscess without resort to debridement of bone or osseous grafting.

References


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