

A case of cervical tuberculosis with severe kyphosis treated with a winged expandable cage after double corpectomy

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In this case report, we demonstrate that the use of a winged expandable cage was able to obtain good clinical and radiological results in a case of cervical tuberculosis with severe kyphosis. However, case series will be necessary to affirm its validity as a stand-alone device for similar cases with high risk of instability.

Keywords: Cervical tuberculosis; winged expandable cage; spondylodiscitis

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Introduction

The use of winged expandable titanium cages (WETC) following single or multiple cervical corpectomy for the treatment of different diseases has been proposed as an alternative to other cervical reconstructive techniques as autologous bone graft (ABG), non-expandable titanium cages (NETC) and expandable titanium cages (ETC). We recently reported (1) good results in a series of patients treated for cervical spondylosis using WETC after single or multiple corpectomy. Herein we report a case of cervical tuberculosis with severe kyphosis treated with this device. Cervical alignment was restored, the patient fully recovered in 2 weeks and post-operative radiological imaging showed good results in terms of stability.

Case presentation

We describe the case of a 44-year-old Nigerian ambassador who used travel to foreign countries for work duties reporting a recent journey in Africa. He presented to our emergency department since affected by severe cervical pain from about 2 weeks. Full blood tests were normal, white cell blood counts, C-reactive protein (CRP), erythrocyte sedimentation rate (ESR) and serum alkaline phosphatase were within the ranges. He did not report history of smoke, alcohol or drug and no previous infection or operation. Neurological examination was



Figure 1 Cervical radiograph demonstrated C4-C5 vertebral bodies collapse.

unremarkable. Cervical radiograph showed C4 and C5 vertebral height loss associated to severe cervical kyphosis (*Figure 1*). Spondylodiscitis was suspected and cervical MRI demonstrated inflammatory tissue at C4-C5 with vertebral body erosion and pre-vertebral abscess (*Figure 2*). Work-up for tuberculosis was negative and thoracic radiograph was normal. Nevertheless, due to the clinical indolent course of infection and destructive behavior, tubercular spondylodiscitis was suspected and the standard four-

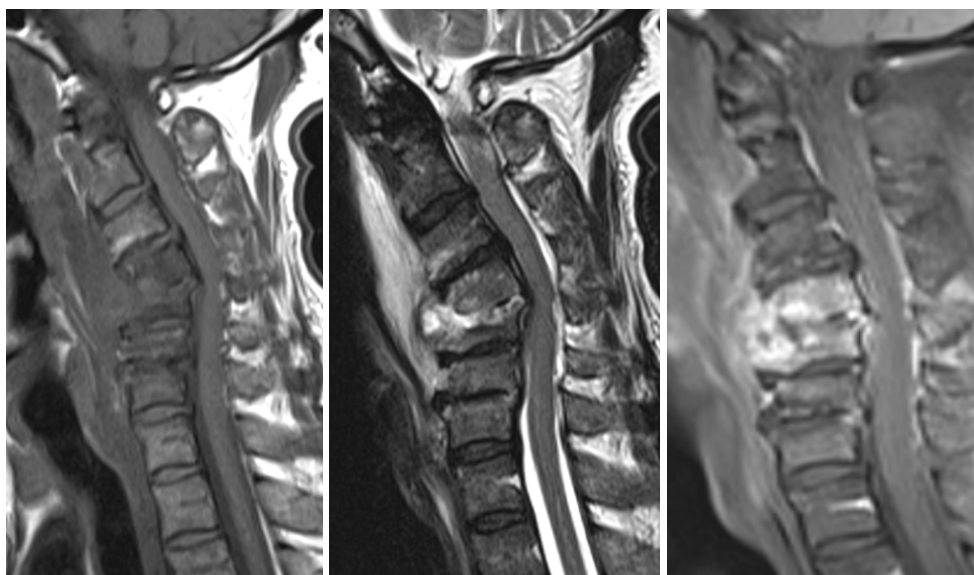


Figure 2 Cervical MRI showed the presence of prevertebral abscess and C4-C5 spondylodiscitis.

drug therapy was started [isoniazid (5 mg/kg), rifampicin (10 mg/kg) ethambutol (15 mg/kg) and pyrazinamide (25 mg/kg)] with the plan to operate the patient after a partial or total resolution of the infection. In the following days, the patient complained uncontrollable pain so we proceeded to a pre-vertebral abscess evacuation followed by C4-C5 corpectomy with insertion of a WETC. Standard left-side anterior cervical approach was executed. Before the insertion of the WETC abundant wash-out, curettage of the inflammatory tissue and careful preparation of the adjacent endplates were executed. Histological examination and microbiological investigation including bacterial, fungal, and mycobacterial stains and culture were taken. In post-operative period, the patient wore Philadelphia collar and post-operative imaging showed good results in terms of kyphosis reduction (*Figure 3*). Tissue examination revealed granuloma formation and polymerase chain reaction (PCR) for Mycobacterium Tuberculosis in tissues was positive. Intravenous antibiotics were continued and the patient fully recovered in about 2 weeks. Cervical radiographs at 2, 4, 8 and 12 weeks from the operation showed the stability of the device, maintenance of cervical alignment and no subsidence. Cervical MRI executed at 2 months demonstrated resolution of the inflammatory process (*Figure 4*).

Discussion

Cervical spondylodiscitis is a quite rare finding respect

the more common location of spinal abscesses in the lumbar and thoracic regions (2). The incidence of spinal tuberculosis is increasing in developed nations and surgical treatment is indicated for cases of instability, deformity, neurological deficit or in cases of resistance to the medical treatment in order to evacuate the abscess and consent the antibiotics to access within the capsule (3).

Over the years, many reconstructive techniques have been proposed after single or multiple cervical corpectomy as treatment for different diseases. The use of an ABG such as iliac or fibular is considered the gold standard, but linked by some authors to donor site morbidity, pseudoarthrosis and graft dislodgement. For the treatment of cervical spondylolysis its use has been reported to be successful despite the presence of infection (4).

After single or multiple corpectomy a NETC was proposed to give more stiffness to the construct but its insertion can be demanding and some authors reported high rate of subsidence due to its scraping on the adjacent endplates.

In the application of metal implants in the presence of infection no implant complications have been reported by some authors (5). On the contrary other authors recommended long-term oral antibiotic regimes, eventual removal of these implants and microbiological resampling (6).

Mondorf *et al.* (7) reported the safe use of polyether ketone (PEEK) cage fusion in 5 patients affected by cervical spondylodiscitis.

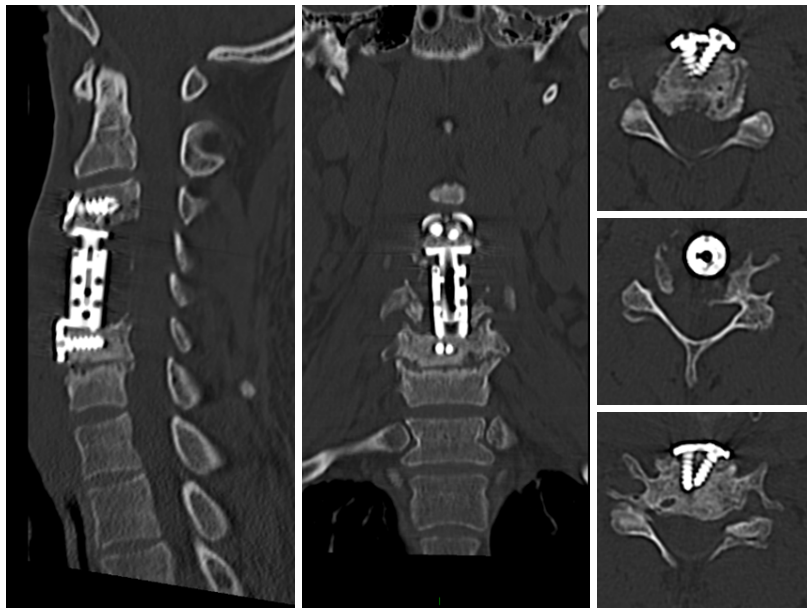


Figure 3 Postoperative cervical CT showed a good realignment of cervical spine and the correct position of the WETC and screws. WETC, winged expandable titanium cage.

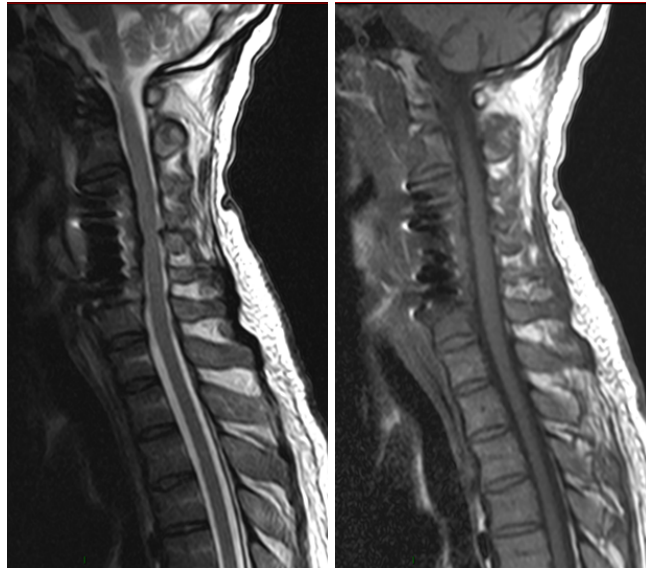


Figure 4 Follow-up cervical MRI demonstrated the resolution of the inflammatory process and no instability of the construct.

The use of ETC has overcome the challenge presented by the insertion of NETC with the possibility to obtain a gradual correction of the cervical lordosis in site after its easy insertion.

Case series reporting its use for different diseases demonstrated good clinical and radiological results (8,9).

Nevertheless, in the use of ABG, NETC and ETC a high rate of subsidence has been reported (10,11) regardless to the disease, perhaps their use without a posterior fixation has been discouraged when multi-level decompression is executed. Sasso *et al.* (12) reported a 6% failure rate following two-level decompression and fusion using

autologous iliac autograft and anterior plating and a 71% failure rate after three-level decompression.

In using WETC, we recently reported (1) good clinical and neurological results in a series of patients treated for cervical spondylosis.

Another issue is if an anterior approach alone is sufficient for cases of cervical spondylodiscitis. Heyde *et al.* (13) reported a series of 20 patients surgically treated for spondylodiscitis using a combined anterior-posterior fixation in 13 cases while an anterior approach alone was used only in 7 cases.

On the other hand, Shousha *et al.* (14) recently evaluated the behavior of cervical spondylodiscitis over a period of two decades in a single institution reporting that anterior surgery alone became more applicable.

Herein we report a case of cervical tuberculosis treated with a WETC in which the correction of a severe kyphosis was obtained and follow-up radiographs demonstrated no subsidence and the stability of the construct. We consider the use of WETC easier in its insertion respect a NETC and more practical respect an ETC since constituted by a single device, the fixation wings work as the anterior plating.

Shousha *et al.* (15) reported that ventral plating after corpectomy for spondylodiscitis should be avoided in order to avoid space available for the abscess formation. Nevertheless, it has been reported that the use of an ETC is considered safe in association to an anterior plating since a major stiffness of up to 254% was demonstrated (16). The use of a WETC can obviate this issue since no space is present between the cage and fixation wings and this may reduce the incidence of abscess formation.

After its insertion, we suggest an adequate preparation of the adjacent endplates in order to increase the adjacency between the bone and WETC and obtain distribution of the forces after its distraction.

Finally, this case report demonstrates that the use of a WETC after double corpectomy for severe kyphosis due to cervical tuberculosis is able to obtain good results in terms of clinical and radiological outcome.

Nevertheless, case series will be necessary to affirm the validity of this device as stand-alone, in particular for cases of cervical tuberculosis with severe kyphosis in which the risk of instability is high.

Conclusions

In using a WETC after single or multiple corpectomy, we

recently reported a series of patients treated for cervical spondylosis.

Herein we report a case of cervical tuberculosis with severe kyphosis treated with this device after double cervical corpectomy. The patient fully recovered in post-operative period, kyphosis was corrected and no subsidence was present at radiological follow-up. This case report demonstrates that good clinical and radiological results can be obtained using this device, nevertheless case series will be necessary to affirm its validity as stand-alone in particular for cases of cervical tuberculosis with severe kyphosis in which the risk of instability is high.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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