CERVICOTHORACIC SPINAL TUBERCULOSIS TREATED WITH A COMBINED SINGLE STAGE SURGERY

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ABSTRACT

Introduction: Cervical spine tuberculosis (TB) is uncommon, accounting for less than 5 percent of total cases. Spinal TB is the most prevalent form of bone TB. Cervical spinal TB is the most dangerous type of TB because of complications from the spinal cord and the neurological disorders it causes.The objective of this paper is to present our experience with a rare case of cervical spine spondylitis. This case stresses the usefulness of a single-step anterior and posterior approach with posterior stabilization.

Method: We present a case report based on our internal documents. We report a case of spondylitis tuberculosis of the C6-C7 cervical spine associated with retropharyngeal abscess in a 15-year-old Indonesian female. Pain in the neck and weakness of the upper and lower limbs were the main features. There was history of weight loss, fever and excessive night sweats. No antecedent history of trauma to the head and neck region.

Results: We did a single-step anterior and posterior approach with posterior stabilization. Anterior approach was done to evacuate and debridement of the retropharyngeal abscess. Posterior approach was done for posterior instrumentation with pedicle screw and dual rod. We did posterior stabilization on Cervical 5-6 and Thoracal 3-4. One week after surgery we found remarkable improvement of the pain and extremities functions.

Conclusion: In the surgical therapy of cervicothoracic TB, a single-step cervical combined anterior – posterior approach with posterior instrumentation were able to perform adequate abscess debridement. Operative management in our patient resulted in remarkable improvement.

Keywords: Cervicothoracic spondylitis, tuberculosis, retropharyngeal abscess, posterior stabilization

ABSTRAK

Pendahuluan: Tuberkulosis cervical jarang terjadi, hanya terdiri dari 3-5 persen kasus tuberkulosis tulang belakang (spondylitis). Spondylitis TB adalah bentuk paling umum dari TBC tulang. Ini adalah manifestasi TB yang paling berbahaya karena keterlibatan medulla spinalis dan kerusakan neurologis yang diakibatkannya. Penelitian ini bertujuan untuk menyajikan pengalaman kami dengan kasus tuberkulosis tulang belakang leher yang jarang terjadi. Kasus ini menekankan kegunaan pembedahan melalui anterior dan posterior *approach* satu tahap dengan stabilisasi posterior.

Metode: Kami menyajikan laporan kasus berdasarkan dikumentasi internal. Yaitu kasus spondylitis TB pada cervical C6-C7 yang berhubungan dengan abses retropharyngeal pada seorang wanita berusia 15 tahun. Nyeri leher dan

kelemahan ekstremitas atas dan bawah adalah keluhan pasien. Terdapat riwayat penurunan berat badan, demam, dan keringat malam. Tidak ada riwayat trauma pada daerah kepala maupun leher.

Hasil: Kami melakukan pembedahan anterior dan posterior satu tahap dengan stabilisasi posterior. Pembedahan anterior dilakukan untuk mengevakuasi dan debridemen abses retropharyngeal. Pembedahan posterior dilakukan untuk instrumentasi posterior dengan pedicle *screw* dan *dual rod*. Kami melakukan stabilisasi posterior pada level Cervical 5-6 dan Thoracal 3-4. Satu minggu setelah operasi, kami menemukan perkembangan yang baik pada nyeri dan fungsi ekstremitas.

Kesimpulan: Dalam tatalaksan bedah spondylitis cervicothoracic, pendekatan kombinasi anterior-posterior satu tahap dengan stabilisasi posterior mampu memberikan hasil yang bermanfaat. Manajemen operatif pada pasien kami menghasilkan perbaikan klinis yang baik.

Kata kunci: Spondylitis cervicothoracic, tuberculosis, abses retropharyngeal

INTRODUCTION

In the past decades we have witnessed the revivification of tubercular disease attributed to the acquired immunodeficiency syndrome, surge of immigration, and impoverished living and sanitary conditions. spinal tuberculosis / spondylitis (STB), which is a common extra-pulmonary, is the most frequent and serious form of skeletal tuberculosis.

However, cervicothoracic STB with neurological deficits has rarely been reported in the literature in case of some cases reports. The anti-TB chemotherapy and external immobilization still play an irreplaceable role in treatment of STB. Cervicothoracic STB with neurological deficits is characterized by kyphosis deformity, abscess formation and spinal cord compression, which usually beyond the chemotherapy function. Therefore, surgical invention will be necessary in these cases.[(1)]

Tuberculosis was previously leading cause of infectious spondylitis. Before the urgent entry of chemotherapy, time and surgery to treat the paralysis were the only options available. Historically, decompressive laminectomy was performed for paralysis, but the results were so disappointing that Ménard accidentally opened and saw the abscess, and the patient's clinical condition had improved. Many patients were treated by this way and eventually die because of secondary bacterial infection, and the treatment was rejected. Other authors, Hibbs and Albee described posterior spinal fusion as the choice of surgery to avoid deformity and accelerate bone healing by internal immobilization. Ito, Tsuchiya, and Asami in 1934 reported a radical debridement procedure and bone graft technique for abscess formation. [(2, 3)]

CASE

Ms. N is a 15-year-old girl Indonesian with severely decreased motoric function on both of her upper and lower extremities since 8 months. The patient had become limited to her bed. She was non ambulatory for the past 6 months due to her tetraplegic conditions. She already taken anti-tuberculosis chemotherapy for 1 month. She had no history of comorbidities related to her current complaints.

Figure 1. Patient's clinical appearance, she was non ambulatory. (source: internal documentation).

On physical examination, she was found to be alert, and well oriented young girl lies on the bed with no apparent distress. The skin over the anterior cervical was intact and no remarkable soft tissue swelling or erythema around the cervical region. The cervical range of motion (ROM) was limited.

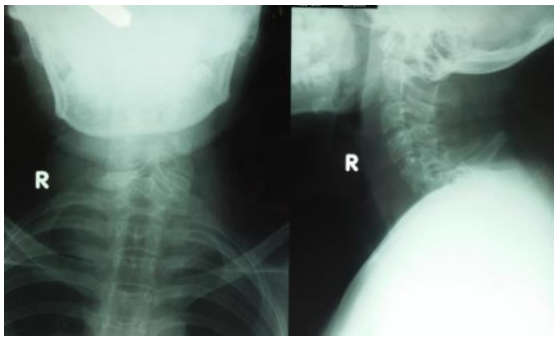

Figure 2. Patient's preoperative X- ray of cervical (source: internal documentation).

The X-ray demonstrated a significant destruction of 6th and 7th cervical spine with kyphotic deformity (Figure. 2). She also underwent cervical MRI examination. It shows anterior and posterior cervical abscess at the level of 6th cervical spine and 2nd thoracal spine. At the posterior side, the abscess markedly comprises the spinal cord at the level of 6th cervical spine to 2nd thoracal spine. It was decided to undergo surgery with combined anterior and posterior approach.

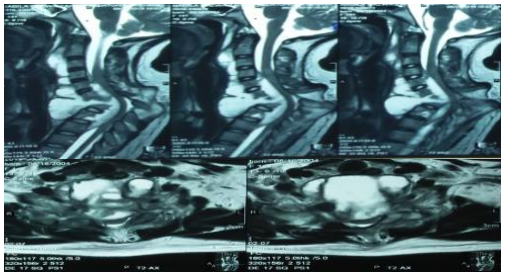

Figure 3. Patient's preoperative MRI of cervical shows marked deformity and abscess. (source: internal documentation).

The anterior approach was planned for anterior debridement and abscess evacuation. The posterior approach was planned for posterior debridement, kyphotic deformity correction and posterior instrumentation stabilization with pedicle screws and dual rods technique. The surgery was performed by the author.

The patient underwent cervical anterior approach first. During the operation clinical features show bony destruction and massive abscess, the specimen was sent to pathological examination. And then we continued the surgery with posterior approach. After clear exposure of the pathological spine, the level was confirmed by image intensifier. During the operation there was marked abscess at the posterior side as well. After debridement and abscess evacuation, it was decided to correct the deformity and stabilization with posterior instrumentation using dual rod system.

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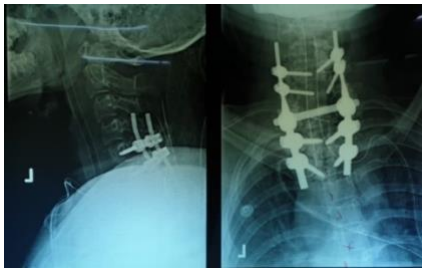

Figure 4. Patients post operative X-Ray after anterior debridement and posterior cervical instrumentation. (source: internal documentation).

After the surgery, the patient worn soft cervical collar brace for external support. One day postoperatively patient felt improvement on her extremities weakness. The surgical wounds were healed without any complications.

Two months after the first stage surgery, she underwent the second stage surgery with anterior instrumentation to prevent progressive kyphotic deformity and to maintain the cervical curvature.

Figure 5. Patient's postoperative X-Ray after anterior and posterior cervical instrumentation. (source: internal documentation).

DISCUSSIONS

Tuberculosis is defined as a case of granuloma with or without pus and acid-fast-positive. The tubercles are formed from monocytes and epitheloid cells that have a forming mass with a central caseation in the presence of Langerhans type giant cells, which have their own characteristics on microscopic examination. When the abscess is enlarged, it follows the course of least resistance and forms necrotic debris. The skin's sinuses show, discharge, and heal suddenly. There are bone reactions to infection vary from no reaction to severe reactions. In the spine, the infection damages the intervertebral disks and it spreads down the posterior and anterior longitudinal ligaments. Epidural infections result in permanent neurological damages.(4)

Constitutional manifestations that gradually predominate in the early stages include fever, malaise, night sweats, weakness, and weight loss. If pain occurs then the symptoms are delayed, which is associated with paralysis and bone collapse.

Cervical complicity may cause hoarseness as a result of dysphagia, recurrent laryngeal nerve paralysis, and respiratory stridor. This symptom can occur from the formation of an anterior abscess. Neurological symptoms usually occur late. Rectal and motor tone function are good prognostic predictors. Jain et al. preconceives that the spinal canal can relocate 76 percent of the disruption on CT scans without neurological impairment. Seddon declared that 60 to 90 percent of Pott paraplegia cases will improve with prolonged bed rest in hospital. (4)

Laboratory studies display chronic disease features. The findings include increased ESR, anemia, and hypoproteinemia. Skin tests can be useful but are not diagnostic. This test is contraindicated in patients who have previously been infected with TB. Due to the increased risk of peeling skin by a profound reaction. (5)

The presence of radiographic findings at the early stage, including localized osteopenia and a subtle decrease in the intervertebral disc space. Subsequent findings of 'concertina collapse' included vertebral collapse, named by Seddon because of its similarity to the accordion. Whereas the late calcification and soft tissue swelling is expected on radiographic findings. CT scanning (without or with contrast) allows a better evaluation of the extent of neurological disorders and pathological processes. The pathological process can be further represented by MRI. Gupta et al noted that the presence of bone fragments and abscess formation are the only MRI findings that help differentiate STB to malignancies.(5)

The definitive diagnosis depends on biopsy of the lesion and culture of the organism. Percutaneous techniques with CT or radiography can usually be adequate. Francis et al. reported 29 patients with suspected STB, 89 percent showed epitheloid granulomas, 83 percent on positive acid-resistant bacillary cultures, and 52 percent positive acid-resistant bacillary smears. Laparoscopic biopsy or percutaneous thoracoscopy are other reported options as noted by Dusmet et al. An open biopsy may be needed if a needle biopsy is unproductive or dangerous, or if open techniques are required.. (5)

Missed diagnoses and late diagnoses are prevalent. The differential diagnosis includes fungal, pyogenic, primary bone tumors (osteosarcoma, myeloma, chondrosarcoma, and bone cysts), secondary metastatic disease, GCT, sarcoidosis, and bone deformities (Scheuermann's disease for example). [5]

A bad complication rate is found in cervical tuberculosis. Hsu and Leong reported that within 40 patients, the spinal cord compression rate was 42.5 percent. In pediatric cases, children under 10 years of age were more feasible to develop abscesses. Meanwhile, older children were more likely to suffers from paraplegia. Chemotherapy and drainage were sufficient for younger children. The Cervical laminectomy causes increased kyphosis, subluxation, and neurologic deficiency. The complications of posterior cervical fusion are persistent pain, kyphosis, and neurological deficiency, which requires strut grafting and anterior debridement. Subluxation was managed with skull traction for reduction, accompanied by surgery for strut bone grafting and anterior decompression.[6]

Patients with neurological deficit may improve without surgery or chemotherapy or with chemotherapy alone, but in general the prognosis is improved with surgery. In one study, 94 percent of neurologically impaired cases clinically improved after anterior decompression surgery; only 79 percent totally recovered after nonoperative management. When patients with a neurological deficit were underwent surgery only if they failed to respond to an initial treatment of antibiotics, the success rate was 78.5 percent. As expected, patients with neurological deficits were less severe and those treated earlier after the development of neurological signs had a better outcome. In one study of 64 patients, only 48 percent of those with severe neurological deficits recovered, whereas 83 percent of patients with moderate deficits recovered; only 4 of 10 patients with late-onset paraplegia had a splendid recovery. Patients with long duration paraplegia should be treated aggressively. Hodgson and colleagues found that the opportunities of complete recovery are good after surgical treatment, although it may take longer time for them to recover. They documented recovery in a patient who had had a neurological deficit for 5 years.[6]

In patients with late-onset paraplegia, the outcomes to surgery is faster and better in patients who have active disease than in those with healed spine TB and a bony ridge compromising the spine medulla. Overall, the majority of patients with a neurological deficit recover within 6 months, but those who have direct involvement of the meninges (pachymeningitis) may recover more gradually. Govender and colleagues found that patients who have an atrophic cord as seen on CT myelography preoperatively usually do defective after surgery. Cervical spine involved patients are at high risk of neurological deficit but may take benefits after anterior débridement and cervical fusion.[6]

CONCLUSION

The spinal tuberculosis surgery with single-stage incorporating both anterior and posterior approach with posterior instrumentation were able to achieve adequate debridement for

cervical spine tuberculosis. Operative management in our patient resulted in remarkable improvement. Success was defined as absence of pain, maintenance of spinal curvature and neurological improvement. After 4 months, the patient able to return to normal activiti.

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