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Outcome of minimally invasive surgery in the management of tuberculous spondylitis

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ABSTRACT

Introduction: With the advancement of instrumentation and minimally access techniques in the field of spine surgery, good surgical decompression and instrumentation can be done for tuberculous spondylitis with known advantage of MIS (minimally invasive surgery). The aim of this study was to assess the outcome of the minimally invasive techniques in the surgical treatment of patients with tuberculous spondylodiscitis.

Materials and Methods: 23 patients (Group A) with a mean age 38.2 years with single-level spondylodiscitis between T4-T11 treated with video-assisted thoracoscopic surgery (VATS) involving anterior debridement and fusion and 15 patients (Group B) with a mean age of 32.5 years who underwent minimally invasive posterior pedicle screw instrumentation and mini open posterolateral debridement and fusion were included in study. The study was conducted from Mar 2003 to Dec 2009 duration. The indication of surgery was progressive neurological deficit and/or instability. The patients were evaluated for blood loss, duration of surgery, VAS scores, improvement in kyphosis, and fusion status. Improvement in neurology was documented and functional outcome was judged by Oswestry disability index (ODI).

Results: The mean blood loss in Group A (VATS category) was 780 ml (330-1180 ml) and the operative time averaged was 228 min (102-330 min). The average preoperative kyphosis in Group A was 38° which was corrected to 30°. Twenty-two patients who underwent VATS had good fusion (Grade I and Grade II) with failure of fusion in one. Complications occurred in seven patients who underwent VATS. The mean blood loss was 625 ml (350-800 ml) with an average duration of surgery of 255 min (180-345 min) in the percutaneous posterior instrumentation group (Group B). The average preoperative segmental (kyphosis) Cobb's angle of three patients with thoracic TB in Group B was 41.25° (28-48°), improved to 14.5° (11°- 21°) in the immediate postoperative period (71.8% correction). The average preoperative segmental kyphosis in another 12 patients in Group B with lumbar tuberculosis of 20.25° improved to -12.08° of lordosis with 32.33° average correction of deformity. Good fusion (Grade I and Grade II) was achieved in 14 patients and Grade III fusion in 1 patient in Group B. One patient suffered with pseudoarthrosis/doubtful fusion with screw loosening in the percutaneous group.

Conclusion: Good fusion rate with encouraging functional results can be obtained in caries spine with minimally invasive techniques with all the major advantages of a minimally invasive procedures including reduction in approach-related morbidity.

Key words: Minimally invasive spine surgery, tuberculous spondylodiscitis, video-assisted thoracoscopic surgery

INTRODUCTION

Minimally invasive techniques in the discipline of spinal surgery have been gradually gaining popularity in the last decade and most of the

open procedures can now be done by minimally invasive technique. The goals of minimally invasive spine surgery (MISS) is to achieve spinal decompression and stabilization matching that of its open counterpart while reducing iatrogenic muscle injury to the back thus reducing the blood loss, narcotic use in postoperative period, and the hospital stay.

Tuberculosis of spine is one of the major causes of spinal deformity and paraplegia. Treatment of tuberculous infection of spine is essentially medical and operative intervention is indicated for complications.^{1,2} Surgical decompression and stabilization is contemplated in few patients to prevent/treat complications arising as a result of the disease or where conservative treatment fails.

While MISS has established itself as an efficient procedure

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Conservative & Operative Management of Tuberculous Spondylitis in Children

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Abstract

Background: Tuberculosis is a deadly disease worldwide. Tuberculosis usually occurs in the lung, but there are other tuberculosis most commonly afflicted by the patient and involves the spine and is called tuberculosis of bones and joints. Management of tuberculous spondylitis is conservative and operative.

Aim: This study aimed to compare the results of conservative and operative therapy in the management of tuberculous spondylitis in children.

Methods: The sample used was teaching with tuberculous spondylitis in Dr. Soetomo General Hospital who underwent operative and conservative therapy that became group 1 and group 2. Inclusion criteria included patients aged <18 years old, suffering from tuberculous spondylitis by conservative or operative therapy in Dr. Soetomo Hospital.

Results: In patients receiving conservative therapy, the Visual analog scale (VAS) decreased significantly ($p = 0.001$), while frankle improved but not significantly ($p = 0.157$). Cobb's angle of patients receiving conservative therapy increased significantly ($p = 0.007$). Patients who received operative therapy showed significant improvement of VAS and Frankle ($p = 0.001$ and $p = 0.011$). The patient's Cobb's angle after surgery decreased but it was not significant ($p = 0.575$).

Conclusion: The role of surgical action has an important role in the treatment of tuberculous spondylitis and gives better results than conservatives in patients with pain, neurological deficits and Cobb's angle progression.

Keywords: Cobb's angle, neurological deficits, tuberculosis, spondylitis, VAS

Introduction

Tuberculosis is still one of the most deadly diseases in the world. According to the world health organization (WHO) in November 2010, one-third of

the world's population is estimated to be infected with tuberculosis germs. Tuberculosis manifestations are usually confined to the lung. However, it can affect any organ such as bone, genitourinary tract and central nervous system known as extra-pulmonary tuberculosis¹. Tuberculosis of bones and joints accounts for 35% of all extrapulmonary tuberculosis cases and most often involves the spine of about 50% of all cases of bone tuberculosis. Spinal involvement is usually a result of hematogenous spread of the pulmonary lesion or from infection of the genitourinary system².

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Functional and Radiological Outcomes of Anterior Decompression and Posterior Stabilization via Posterior Transpedicular Approach in Thoracic and Thoracolumbar Pott's Disease: A Retrospective Study

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Study Design: This is a retrospective study.

Purpose: To determine the efficacy and safety of a posterior transpedicular approach with regard to functional and radiological outcomes in people with thoracic and thoracolumbar spinal tuberculosis.

Overview of Literature: Spinal tuberculosis can cause serious morbidity, including permanent neurological deficits and severe deformities. Medical treatment or a combination of medical and surgical strategies can control the disease in most patients, thereby decreasing morbidity incidence. A debate always existed regarding whether to achieve both decompression and stabilization via a combined anterior and posterior approach or a single posterior approach exists.

Methods: The study was conducted at the Indian Spinal Injuries Centre and included all patients with thoracic and thoracolumbar Pott's disease who were operated via a Posterior transpedicular approach. Data regarding 60 patients were analyzed with respect to the average operation time, preoperative and postoperative, 6 months and final follow-up American Spinal Injury Association (ASIA) grading, bony fusion, implant loosening, implant failure, preoperative, postoperative, 6 months and final follow-up kyphotic angles, a loss of kyphotic correction, Oswestry disability index (ODI) score, and visual analog scale (VAS) score. Data were analyzed using either a paired *t*-test or a Wilcoxon Signed Rank test.

Results: The mean operation time was 260±30 minutes. Fifty-five patients presented with evidence of successful bony fusion within a mean period of 6±1.5 months. Preoperative dorsal and lumbar angles were significantly larger than postoperative angles, which were smaller than final follow-up angles. The mean kyphotic correction achieved was 12.11±14.8, with a mean decrease of 5.97 and 19.1 in VAS and ODI scores, respectively.

Conclusions: Anterior decompression and posterior stabilization via a posterior transpedicular approach are safe and effective procedures, with less intraoperative surgical duration and significant improvements in clinical and functional status.

Keywords: Thoracolumbar spine; Pott's disease; Transpedicular approach; Posterior stabilization; Anterior decompression

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ORIGINAL ARTICLE

Outcome assessment in conservatively managed patients with cervical spine tuberculosis

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Study design: Cervical spine tuberculosis is a relatively less frequent form of spinal tuberculosis. Cervical spine tuberculosis has a greater propensity to involve the spinal cord and results in major sensory motor deficit. In this prospective study, we aimed to evaluate the clinical and imaging predictors of outcome in conservatively managed patients.

Methods: In this study, 42 patients of cervical spine tuberculosis were included. Patients were subjected to a detailed clinical evaluation and magnetic resonance imaging. Patients were treated with antituberculosis treatment and were followed up for 18 months. The Modified Barthel index (MBI) was used to assess the disability. Good outcome was defined as MBI > 12 and poor outcome as MBI ≤ 12. Clinical and imaging characteristics were used to analyze the predictors of outcome, using univariate and multivariate analysis.

Results: Four (9.5%) patients required surgery. Data from 38 patients, who were conservatively managed, were analyzed for predictors of outcome. Among conservatively managed patients, at presentation, 29 patients had an MBI score of ≤ 12. At 18 months, the majority of patients (81.6%) had a good outcome. On univariate analysis, a duration of illness > 3 months, a major motor deficit, bladder involvement, flexor spasms, significant cord compression and spinal extension of the abscess were significantly associated with a poor outcome. However, on multivariate analysis significant cord compression ($P=0.003$) and spinal extension ($P=0.02$) showed a significant correlation with a poor outcome.

Conclusion: Medical management was effective in cervical spine tuberculosis. Patients with significant cord compression and spinal extension of the abscess showed poorer outcome.

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INTRODUCTION

The cervical spine is relatively less frequently affected by tuberculosis compared with lumbar and thoracic spines. Cervical spine tuberculosis is a distinctly different entity because of several reasons. Cervical spine tuberculosis has a greater propensity to involve the spinal cord, resulting in major sensory motor deficit.¹ In addition to this, cervical spine tuberculosis, because of a retropharyngeal collection of pus, can produce compression over the trachea, which may lead to respiratory insufficiency.²

Controversy exists regarding the preferred treatment of choice. Some experts advocate medical therapy alone and some prefer combination antituberculosis chemotherapy and surgery. Most patients with spinal tuberculosis respond to medical treatment.³ Antituberculosis treatment protocols used for treatment of spinal tuberculosis vary from 6 to 18 months. British Medical Research Council studies have indicated that thoracolumbar spinal tuberculosis needs to be treated with a combination antituberculosis treatment regimen for 6–9 months.⁴ An Indian study, with a follow-up period of 10 years, observed no significant differences in the clinical and radiological status between patients who received 6 months and those who received 9 months of antituberculosis treatment.⁵ British Medical Research Council studies did not include patients with cervical spinal tuberculosis. Surgery is usually indicated if a patient has progressive neurological deficit, a large paraspinal abscess or severe deformity.³

A Cochrane review assessing the role of routine surgery in addition to chemotherapy in spinal tuberculosis also concluded that evidence was insufficient for the routine use of surgery.⁶ The Medical Research Council (MRC) study found no definite advantage of early surgery over medical management. However, they had excluded patients with cervical spine involvement.⁷ In retrospective studies on cervical spine tuberculosis, medical management alone has been tried and found to be associated with a good outcome. Some reports have indicated that patients in whom magnetic resonance imaging (MRI) shows a relatively preserved cord with evidence of myelitis or edema and a predominantly fluid collection in the extradural space respond well to conservative treatment. Patients with extradural compression by granulation tissue with little fluid component compressing or constricting the cord circumferentially with cord edema/myelitis or myelomalacia need early surgical decompression.⁸ Even in patients with cranio-vertebral junction tuberculosis, antituberculosis therapy is the mainstay of treatment along with neck stabilization regardless of the extent of bony destruction.⁹ If atlantoaxial instability is present, surgery may be contemplated.^{10–12} Regarding cervical spinal tuberculosis only limited data, either in the form of isolated cases or small case series, are available.¹³

The aim of this prospective follow-up study was to assess the clinical and imaging predictors of outcome in conservatively managed patients of cervical spine tuberculosis.

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The Effects of Rehabilitation Programs on Spinal Cord Injury Patients at Dr. Soetomo General Hospital

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Keywords: SCI, Rehabilitation, Barthel Index, Discharge Condition

Abstract: Acute medical management of people with SCI focuses on minimizing further neurological damage to the spinal cord and optimizing recovery. Dr Soetomo Hospital Surabaya as a referral center in eastern Indonesia often gets referral of patients with spinal cord injury severely cases. This research is a descriptive study. Sample of study were all inpatients who were consulted at the medical rehabilitation, from January 2018 until Desember 2018. All patients received rehabilitation programs while in care (\pm 17,73 days). Level of injury severity of SCI (AIS criteria), changes barthel index (BI) and discharge condition were investigated. There were 1264 inpatients, 166 patients (13,13%) were SCI patients who were consulted at the department of medical rehabilitation. The most cases are caused by tumor 31,32%, AIS A 37,95%, location of injury at thoracic region 51,20%. Complications were bladder disturbance at 77 patients, bowel disturbance 74 patients, and ulcer decubitus there were 31 patients, home return rate 68,07%, death 19,28% and discharge against medical advice 12,6%. From Neurology ward that received rehabilitation programs 68,57% increased Barthel index. Management SCI patients with multidisciplinary teams between neurology, surgery and rehabilitation department at Dr. Soetomo Hospital can increase barthel index and home return rate.

1 INTRODUCTION

The incidence of Spinal Cord Injury (SCI) in various countries is quite high every year. With the expansion of human activities, the incidence of SCI also increased gradually. The incidence varied from 13.019 per million to 163.420 per million people. Among them, the incidence rates of developed countries ranged from 13.121 to 163.420 per million people. The rates of non developed countries varied from 13.019 to 220.022 per million people. The epidemiology in different regions is of significant difference, which may be resulted from economic, science and technology, medical, geographical and even social conditions (Kang Y et al, 2018).

The most obvious consequence of spinal cord injury (SCI) is paralysis. However, SCI also has widespread consequences for many body functions, including bladder, bowel, respiratory, cardiovascular and sexual function. It also has social, financial and psychological implications, and increases people's susceptibility to late-life renal complications as well as musculoskeletal injuries, pain, osteoporosis and

other problems. Acute medical management of people with SCI focuses on minimizing further neurological damage to the spinal cord and optimizing recovery. Stability of the spine is clearly a priority. Physiotherapy is predominantly focused on treating respiratory complications and preventing secondary musculoskeletal problems related to prolonged bed rest (Lisa, 2016).

In Indonesia, several hospitals have SCI-related treatments in intensive care, surgery, and anesthesiology. Rehabilitation services for people with SCI are provided by well-trained health professionals such as physiatrists, nurses, and allied health professionals (Angela et al, 2017).

Dr Soetomo Hospital Surabaya as a referral center in eastern Indonesia often gets referral of patients with severe cases of spinal cord injury. Team collaboration is needed in dealing with SCI patients. The neurological and surgery department often consults SCI patients to the rehabilitation department to help improve quality of life and

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Clinical case / Cas clinique

Patients with complicated Pott's disease: Management in a rehabilitation department and functional prognosis

Prise en charge en milieu de rééducation et pronostic fonctionnel des patients atteints de mal de Pott compliqué

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Abstract

Objective. – The objective is to study the rehabilitation management and to assess autonomy in daily life activities as well as walking recovery in patients with complicated Pott's disease.

Patients and methods. – Retrospective study in nine patients over a period of 8 years extending from 2000 to 2008, collated in the Department of Physical Medicine and Functional Rehabilitation, CHU Sahloul, Sousse, Tunisia.

Results. – The mean age of our patients was 43.8 years; sex ratio was 5/4. The spine involvement of tuberculosis was dorsal in seven cases, dorso-lumbar in one patient, and multiple (cervical, dorsal and lumbar) in one case. All patients were paraplegic with a neurological involvement of the bladder. They had prior antituberculosis chemotherapy for at least 8 months. Decompression surgery was performed in six cases. Two female patients presented disorders of spinal posture during treatment requiring surgical revision with osteosynthesis. All patients received additional rehabilitation care. Following a mean duration of hospitalisation in the Rehabilitation department of 47 days with twice-daily sessions of tailored physiotherapy, three patients remained in complete paraplegia, autonomous in wheel-chair and with vesical and sphincter incontinence. The measure of functional independence (MFI) was at admission/discharge 71/92.

Conclusion. – Rehabilitation takes an important place in the medico-surgical management in Pott's disease, to limite or compensate the disabilities and handicap related to this pathology.

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Keywords: Pott's disease; Paraplegia; Neurogenic bladder; Autonomy

Résumé

Objectif. – L'objectif est d'étudier la prise en charge en rééducation et évaluer l'autonomie dans les activités de la vie quotidienne et la récupération de la marche chez les patients atteints de mal de Pott compliqué.

Patients et méthodes. – Étude rétrospective de neuf patients sur une période de huit ans étendue de 2000 à 2008, colligée au service médecine physique et de réadaptation fonctionnelle, CHU Sahloul, Sousse, Tunisie.

Résultats. – L'âge moyen de nos patients était de 43,8 ans, le sex-ratio est 5/4. La localisation vertébrale de la tuberculose était dorsale dans sept cas, dorso-lombaire chez un patient et étagée (cervicale, dorsale et lombaire) dans un cas. Tous les patients étaient paraplégiques avec une vessie neurologique. Ils ont eu une chimiothérapie antituberculeuse pendant au moins huit mois. La chirurgie de décompression a été réalisée pour six cas. Deux patientes ont présenté au cours du traitement des troubles de la statique rachidienne ayant nécessité une reprise chirurgicale avec ostéosynthèse. Tous les patients ont eu un complément de prise en charge en rééducation. Après une durée moyenne d'hospitalisation en milieu de rééducation de 47 jours avec des séances biquotidiennes de kinésithérapie adaptée, trois malades sont restés en paraplégie complète, autonomes au

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