



A study on Pott's Disease

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Abstract

Pott's Disease also known as tuberculosis spondylitis, is a infectious disease of the spine which is typically caused by an extra spinal infection. Pott's disease is a combination of osteomyelitis and arthritis which involve single multiple vertebrae. The typical site of involvement is the anterior aspect of the vertebral body adjacent to the subchondral plate and occurs most frequently in the lower thoracic vertebrae. A possible effect of this disease is vertebral collapse and when this occurs anteriorly, anterior wedging results, leading to kyphotic deformity of the spine. Other Possible effects can include compression fractures, spinal deformities and neurological insults, including paraplegia.

Keyword: *Pott's, vertebrae, Kyphosis, Clonus, Flaccid, PCR, Cold abscess.*

Introduction

Spinal Tuberculosis accounts for more than 50% of skeletal tuberculosis and is caused by mycobacterium tuberculosis. Infection result from haematogenous Dissemination from a primary focus, usually the although the associated active focus is identified in less than 10%. The lumbar vertebrae can be involved from infection through the Batson's perivertebral venous plexus. The most common site of infection is the paradiscal type with secondary involvement of the disc. In children, extensive involvement with complete destruction of many adjacent vertebral bodies may be seen. Posterior structures are involvement only in about 10% and skip lesion can be identified in 15% pathology is one of caseation

with progressive destruction of the bone and abscess formation, which may track down along fascial planes according to the region of the involvement .

Incidence

In 2005, there were 8.8 million new patients with tuberculosis (TB) all over the world, Although the incidence of tuberculosis increased in the late 1980's to early 1990's, the total number of cases has decreased in recent years. Pott's disease is the most common manifestation of musculoskeletal TB, accounting for approximately 40-50%. Internationally, approximately 1-2% of total tuberculosis cases are attributable to pott's disease.

Pathology of Pott's Disease

The organism that has been identified as causing Pott's disease is mycobacterium tuberculosis. The primary mode of transmission the bacteria travels to the spine is hematogenously from an extraspinal site of infection. It is common to travel from the lungs in adults but the primary site of infection is often unknown in children. The infection can spread, through the lymphatic system. once being spread, the infection can target vertebrae, intervertebral discs, the epidural or intradural space within the spinal canal and adjacent soft tissue. When the infection is developing, it can spread up and down the vertebral column, stripping the anterior and posterior longitudinal ligaments and the periosteum from the front and sides of the vertebral bodies. This result in loss of the periosteal blood supply and distraction of the anterolateral surface of the vertebrae.

If a single vertebra is affected, the surrounding intervertebral discs will remain normal. However, if two adjacent vertebrae are affected, the intervertebral disc between them will also collapse and become avascular. Due to the vascularity of intervertebral disc in children, the disc can become a primary site of infection rather than spreading from the vertebrae.

Spinal cord Compression in pott's disease is usually caused by para vertebral abscess which can also develop calcification or sequestra within them. if the infection reaches adjacent ligaments and soft tissue, a cold abscess can also form. Abscess in the lumbar region may descend down the sheath of the psoas to the femoral trigone region and eventually erod into the skin. Other causes of neurological involvement include dural invasion from granulation tissue, sequestered bone, intervertebral disc collapse or dislocate vertebra. Neurological symptoms can occur at any point, including years later as a result of stretching of the spine of the spinal cord within the vertebral form an of the deformed spine.

Clinical Presentation

Spinal involvement

- Lower thoracic vertebral is the most common area of involvement (40-50%, Followed by the Lumbar spine (35- 45%)
- Approximately 10% of pott's disease case involve the cervical spine.
- The thoracic spine in about 65% of cases , and the lumbar, cervical and thoracolumbar spine in about about 20% , 10% and 5% , respectively
- The atlanto-axil region may also be involved in less than 1% of cases

Diagnostic Test

Mantoux test (tuberculin Skin Test)

Injection of a purified protein derivate (PPD). Result are positive in 84_95% of patients with Pott's disease who are not infected with HIV.

Erythrocyte Sedimentation Rate (ESR)

ESR may be markedly elevated (>100mm/h)

Microbiology studies

Microbiology studies are used are used to confirm diagnosis. Bone tissue or abscess sample are obtained to stain for acid-fast bacilli (AFB, and organisms are isolated for culture and susceptibility. CT-guided procedures can be used to get percutaneous sampling of affected bone or soft tissue structures; however, these study finding are positive in only about 50% of the case.

Radiography

Radiographic studies changes Associated with Pott's disease present relatives late. The following are radiographic changes characteristic of spinal tuberculosis on plain radiography:

- Lytic destruction of anterior of vertebral body
- Increased anterior wedging
- Collapse of vertebral body
- Reactive sclerosis on a progressive Lytic process
- Enlarged psoas shadow with or without calcification
- Vertebral end plates may be osteoporotic

- Intervertebral disks may be shrunk or destroyed
- Vertebral bodies show variable degrees of destroyed
- Fusiform paravertebral shadows suggest abscess formation
- Bone lesions may occur at more than one level

CT Scanning

CT scanning provides much better bony detail of irregular lytic lesions, sclerosis, disk collapse and disruption of bone circumference. Low contrast resolution provides a better assessment of soft tissue, particularly in epidural and paraspinal areas. CT scanning reveals early lesions and is more affective for defining the shape and calcification of soft tissue abscesses which is common in TB lesions.

MRI

MRI is the criterion gold standard for evaluating disk-space infection and osteomyelitis of the spine and is most effective for demonstrating the extension of disease into soft tissue and the spread of tuberculous debris under the anterior and posterior longitudinal ligaments. MRI is also called the most effective imaging study for demonstrating neural compression. MRI finding useful to differentiate tuberculosis spondylitis from pyogenic spondylitis include thin and smooth enhancement of the abscess wall and well-defined paraspinal abnormal signal, whereas thick and irregular enhancement of abscess wall and ill-defined paraspinal abnormal signal suggest pyogenic spondylitis. Thus contrast-enhanced MRI appears to be important in the differentiation of these two types of spondylitis.

Biopsy

Use of a percutaneous CT-guided needle biopsy of bone lesion can be used to obtain tissue samples. This is a safe procedure that also allows therapeutic drainage of large paraspinal abscesses.

Polymerase Chain Reaction (PCR)

PCR techniques amplify species-specific DNA sequence which is able to rapidly detect and diagnose several strains of mycobacterium

without the need for prolonged culture. They have also been used to identify discrete genetic mutations in DNA sequences associated with drug resistance.

Medical Management

Treatment Goals

- Confirm Diagnosis
- Eradicate infection
- Identify and remove Causative Pathogen
- Recover/Maintain Neurological Function
- Recover / Maintain Mechanical Spine
- Correct or Prevent Spinal Deformity and Possible Sequelae
- Function Return to Activities of Daily Living (ADL)

Treatment Techniques

- Anti-Tuberculosis Chemotherapy
- Surgical Drainage of Abscess
- Surgical Spinal Cord Decompression
- Surgical Spinal Fusion
- Spinal Immobilization

Medical Treatment

The duration of treatment is somewhat controversial. Although some studies favor 6 to 9 months course, traditional courses range from 9 months to longer than 1 year. The duration of therapy should be individualized and based on the resolution of active symptoms and the clinical stability of the patient.

Isoniazid

View full drug information: <http://reference.medscape.com/drug/isoniazid-342564> highly active against Mycobacterium tuberculosis. Has good GI absorption and penetrates well into all body fluids and cavities.

Rifampicin

View full drug information: <http://reference.medscape.com/drug/rifadin-rimactane-rifampin-342570> for use in combination with at least one other antituberculous drug; inhibits DNA-dependent bacterial but not mammalian RNA polymerase. Cross-resistance may occur.

Pyrazinamide

View full information:
<http://reference.medscape.com/drug/pyrazinamide-342678>

Bactericidal against M tuberculosis in an acid environment (macrophages). Has good absorption from the GI tract and penetrates well into most tissues, including CSF.

Ethambutol

View full drug information:
<http://reference.medscape.com/drug/myambutol-ethambutol-342677>

Has bacteriostatic activity against M tuberculosis. Has good GI absorption. CSF concentrations remain low, even in the presence of meningeal inflammation

Streptomycin

View full drug information:
<http://reference.medscape.com/drug/streptomycin-342682>

Indication for surgery in pott's Disease

- Neurological deficit
- Severe neurological deficits at presentation
- Rapidly worsening deficits
- New onset or deteriorating deficits during chemotherapy
- Unimproved deficits after 6-8 weeks of chemotherapy
- Spinal instability
- Panvertebral disease
- >3 Contiguous vertebra involved
- Vertebral body loss > 1 in thoracic spine and 1.5 in lumbar spine
- Children with spine at risk
- Posterior neural arch with pedicular destruction
- Clinical instability
- Late deformity
- Severe kyphosis with late onset neurological deficits
- Failure of clinical improvement after 6 weeks of chemotherapy
- Disease recurrence despite chemotherapy
- Primary drug resistance

Various Surgical Approaches

Various surgical techniques are utilized based on which area of the spine is affected. In the upper cervical spine, a transoral or extreme lateral approach is taken which typically require concurrent occipito –cervical fusion to prevent collapse, instability and delayed deformity. Midcervical lesions are often treated with standard anterior cervical approaches and achieve excellent result. Transsternal, transmanubrial, or lateral extracavitary approaches are conducted in patients with involvement of the lower cervical /upper thoracic spine. In the thoracic spine surgeons make use of transthoracic, extrapleural anterolateral or extended posterolateral approaches. The posterolateral method is more often utilized in severe cases of kyphosis due to the nature of the spinal deformity and ease of access to the spine. However, surgical correction of a severe kyphotic deformity (>30) degrees will often require a posterior technique that is complex and technically demanding procedures with; an 8-10% incidence post correction neurological complications. Surgical procedures in the lumbar spine are typically performed through a lateral retroperitoneal procedure.

Case Report

A 40 years old man got conceded into CDH in our Spine OPD chamber with presentation of dynamic shortcomings of both lower appendages for four weeks and releasing sinus in lower back. He had refused some weight and diet and irregular evening rise of fever of as long as two and half months. He did not give any history of neither night sweats nor haemoptysis. None of his relatives at any points experience Tuberculosis. Our examination he was observed to be a young fellow of normal body. His lower limbs were spastic paraparesis with power grade of 3/5. Tangible assessment uncovered no normalizes; he had delicacy over the upper dorsal spine without any gibbous. There was no history of injury over the lower dorsal area with which had swamp on top of it and serous release. He expresses that two

and half months back he had Para vertebral swelling over the lower dorsal district and which was depleted in the outpatient division with no earlier examination. From that point forward he had been experiencing consistent dressing without any change his negative for tuberculosis. X-ray of spine revealed a lesion resolving the D2 left hemilaminae at the D1-D2 level Which was hypo extreme in D2 weighted picture and hyper exceptional in D3 recommending an ulcer. We investigated the sore by slandered method. When we achieved the D2 lamina semi solid discharge like mushy materials turned out. Laminectomy

was not important as the lesion had pulverized its greater points. Fluid discharge garbage from ulcer depression were collected and sent for both histopathology and gen expert. Biopsy from the cavity divider uncovered granulomatous injury lesion with tuberculosis spondylitis. Persistent was encouraged to begin hostile to Koch treatment. Past operatively his Para paresis in handed and begin strolling with help presently following multi months post operatively the releasing sinus in lower dorsal level has relatively minded and he is enhancing bit by bit with physiotherapy.



Analysis

Spinal TB is the consequences of hematogenous spread from an essential core interest. In our patient, no essential center could not be identified. The analysis of TB spine has been founded on a mix of clinical and radiological discoveries. X-ray in thought to be the most exact diagnostic tool. There are a few imaging discoverers suggestive of pott's spine. Affirmation of the infection requires biopsy showing corrosive quick bacilli on microscopy is disengaging culture of the live from. Gene expert PCR has been viable indicative device for aspiratory tuberculosis and is presently thought to have high effetely and specifying for additional lung TB too.

Likewise with most different types of additional pneumonic TB, anti tuberculosis chemotherapy is the backbone of treatment for spine TB. Treatment ought to at first incorporate ionized,

rifampicin pyrazinamide and either etham butol or streptomycin and can be adjusted in view of consequences of testing changing treatment lengths extending from 9 to year and a half have been accounted for, the preservationist approach with therapeutic treatment is favored for early aliment however careful intercession might be exceed to anticipate neurological outcomes. Neurosurgical mediations can consider remedy of distortions, canker debridement spinal line decompression or lasting spinal adjustment. Despite the fact that advances in MRI ought to expectedly enhance analysis time, the analytic postponement for spinal Tb has remained stable. The course of the treatment in our patient portrayed in this repot demonstrates a few mix-ups which brought about that the determination of tuberculosis spondylitis was made late.

In patient with a dorsal upper par vertebral boil tuberculosis sodalities ought to be suspected and exhaustive epidemiological clinical and research facility examinations be done and proper treatment presented at the earliest opportunity.

Conclusion

Careful treatment is as yet the favored treatment joined with antituberculous chemotherapy for tuberculous spine ailment patient with myelopathy. In our foundation, the corpectomy debridement method together with combination with autologous (iliac) bone unite gives fulfilling result.

In our nation, specialists tend to deplete abscess without earlier examinations. Paravertebral ulcer ought to be deleted after appropriate whole spinal evaluation. This can in this manner keep the noteworthy neurological entanglements and great careful result can be achieved. Considering the conclusion of TB and deliberately surveying hazar components can stay away from delays in its analysis and administration.

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