Role of Spinal Instrumentation in Management of Spondylodiscitis

Thesis

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LIST OF ABBREVIATIONS

CRP	C-Reactive Protein
CT	Computerized Tomography
ELISA	Enzyme Linked Immunosorbant Assay
ESR	Erythrocyte Sedimentation Rate
FDG-PET	Fluorodeoxyglucose Positron Emission Tomography
Ga-67	Gallium-67
IV	Intravenous
IM	Intramuscular
MDP	Methylene Diphosphonate
MRI	Magnetic Resonance Imaging
PEEK	polyetheretherketone
PCR	Polymerase Chain Reaction
q12h	every 12 hours
q6h	every 6 hours
SPECT	Single Photon Emission Computed Tomography
TB	Tuberculosis
Tc-99	Tecnetium-99
TLIF	Transforaminal Lumbar Interbody Fusion
VB	Vertebral Body

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Aim of the work

- Reviewing the literatures regarding:
  - ✓ Definition of spondylodiscitis.
  - ✓ Clinical aspects of spondylodiscitis.
  - ✓ Diagnosis of spondylodiscitis.
  - ✓ Different modalities of management of spondylodiscitis.
- Evaluation of safety and effectiveness of instrumentation in the surgical management of spondylodiscitis regarding clinical and radiological outcome.

INTRODUCTION

Spondylitis is osteomyelitis of the spinal column. This is defined as infection accompanied by destruction of vertebral bodies, starting at the endplates, but with secondary involvement of intervertebral discs. The term "spondylodiscitis" means primary infection of intervertebral disc by a pathogen, with secondary infection of neighboring vertebral bodies ***(Cramer et al., 2003).***

Spondylodiscitis is rare, but there is increase in number of patients which become a global health concern. It is currently due to reactivation of latent infections, more drug resistant agents and more immunocompromised patients. It has been shown that delay in diagnosis can lead to increased morbidity and mortality; early diagnosis and treatment are therefore of paramount importance ***(Ozalay et al., 2010).***

The majority of patients with spondylodiscitis can be treated successfully with conservative management. Pharmacological treatment can terminate the infection but may not prevent a crippling deformity that could lead to perpetual pain ***(Lim et al., 2008).***

The indications for surgery include one or a combination of the following pathological changes: severe destruction of endplates, abscess formation, chronic osteomyelitis with biomechanical instability, neurologic deficit, local kyphosis, severe pain, septic pseudarthrosis or refractoriness to conservative treatment ***(Lim et al., 2008).***

There is a broad range of options for the surgical management of spinal infections, which include anterior or posterior approach, single-stage or two-stage surgery, with or without instrumentation. The role of spinal instrumentation in the presence of active infection is still controversial ***(Lim et al., 2008).***

Several authors have suggested bed rest and prolonged external bracing rather than placing spinal instrumentation ***(Asamoto et al., 2005).***

Others have advocated a staged instrumented operation with a period of antibiotics therapy after debridement only surgery ***(Ozalay et al., 2010).***

Numerous reports have demonstrated that stainless steel and titanium have different biocompatibility characteristics which consequently

could influence bacterial or cell adhesion and colonization. However, the results were inconsistent. Some in vivo or in vitro researches implicated that stainless steel was more likely to be colonized by microbes, but contradictory results could also be found in other literature ***(Haky et al., 2005).***

But it was not until the 1990s of the last century, internal fixation started gaining some acceptance in reconstructive surgery performed in the setting of active infection, and more and more surgeons reported their series of surgical treatment of spinal infections with excellent results ***(Christodoulou et al., 2006).***

HISTORICAL PERSPECTIVE

The ancient Egyptians have been the earliest people suffering from spondylodiscitis, especially tuberculous type. The earliest mummy found with spinal TB is actually a predynastic female from Esna. **Figure (1)**

There is evidence from other mummies and statues with changes consistent with tuberculosis described in human skeletons dating back to the Iron Age; which means that infection of the spine is an ancient disease ***(Tayles et al., 2004).*** **Figure (2)**

According to ***Dimar et al., (2004)*** Hippocrates was the first to describe osteomyelitis of the spine in 400 BC.The first account of pyogenic vertebral osteomyelitis is credited to the French physician Lannelongue in 1879. The first large series of pyogenic vertebral infections in the English literature was published by Kulowski in 1936. Improvements in surgical and radiological techniques and the discovery of antimicrobial therapy have transformed the outlook for patients with this condition, but morbidity remains ***(Gouliouris et al., 2010).***

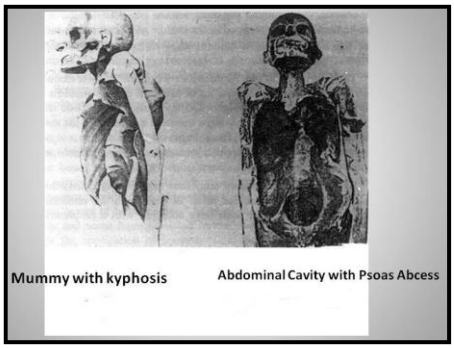

Figure (1)

Figure (2) A picture of wooden statue of a man with hunch back deformity, sharp angulation of spine suggest TB (Egyptian Museum)

The ancient Egyptians had tried to solve their medical problem with all resources they had at that time. **Figure (3)**