Original Article

Cage Loosening In Tuberculosis Of Dorsal Spine

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Objective: To investigate the incidence of cage loosening in patients operated for tuberculosis of spine in different teaching hospitals.

Material & Methods: This retrospective study was done on 50 individuals who had tuberculosis of dorsal spine with paraplegia and were operated. These patients underwent anterior decompression and cage fixation between 2000 and 2004.Those who had completed 4 years of follow up were included in the study. The diagnosis of loosening of cage was made on x-rays which were available at the time of study.

Results: Out of 123 cases operated between 2000 and 2004 for tuberculosis of dorsal spine, 50 were available for follow up. These patients were examined clinically and radiographically. Loosening was defined as a zone of osteolysis more than 2 mm around the cage on either view or cage displacement from its operative position more than 4mm.There were 31males and 19 females with age ranging from 21 to 70 years. Cage loosening was seen only in one patient (2%). 49 patients showed good results and were disease free.

Conclusion: Cage loosening has not been noticed in our patients who were operated for T.B spine where anterior decomposition and cage fixation was done for treatment purposes.

Key Words: Cage loosening, T.B spine.

Introduction

Tuberculosis of bones and joints is increasing all over the world and there is a reasonable increase in the incidence of T.B spine.[1] Spinal tuberculosis has existed for at least 5000 years. Incidence of spinal tuberculosis is rapidly increasing in developing countries because of poverty and drug resistance and in Europe and America because of HIV infection.[2] Hippocrates (460BC - 370BC) was the first to suggest a possible relationship between spinal deformity and pulmonary disease. Dale champs (1513), a French surgeon, added a very important factor by discovering its relationship to paralysis of lower extremities.[3,4] Hippocrates and Galen (131-21 AD) tried to correct kyphotic deformity due to tuberculosis of spine by manual pressure, traction and mechanical appliances but failed. The orthodox conservative treatment was entirely constitutional in its character and strongly advocated recumbency, immobilization by means of body casts, plaster beds and braces. Spinal tuberculosis has deformed, paralysed and killed many of the human races for the past 7000 years. No race is immune to this disease.[5] This initial trend in the treatment of spinal tuberculosis was towards surgery.[6] As early as 1779, Sir Percival Pott recommended "to reduce the discharge" meaning to drain the absences, and reduce erosion of the bones. In 1871, Michaud presented an illustrative histological evidence of the concept that tuberculosis infection in Pott's disease may pass through the barrier of coverings of spinal cord and such inflammation may cause irreversible type of paraplegia.[7] Among others Rosenheim, Spiller and Gordon produced histological evidence of involvement of the cord and its coverings by the tuberculosis. In 1900 Menard described the operation of "Drainage Laterale." In 1935 Sir Herbert Seddon described a similar operation in the British Journal of Surgery which called as "costotransversectomy." This is also called Capner's procedure, because Norman Capner claimed that he instructed Herbert Seddon, how to carry out this operation. Medical and surgical strategies can control the disease in most patients.[8,9,10]

Material and Methods

Anterior decompression and cage fixation is a common procedure done for tuberculosis of spine with paraplegia. Out of one hundred and twenty three cases operated between 2000 and 2004, fifty were included in the study. Only those cases were included who had completed 4 years of follow up and were available at the time of study. All those included in the study had fulfilled the strict criteria of inclusion. Only those were included who had TB of dorsal spine between D6 & D12 vertebra and presented with paraplegia of more than one month. The patients with more than one level involved i.e. where disease involved more than two adjacent vertebrae were not

included in the study. Where disease was associated with co-morbid hepatitis, conditions like diabetes mellitus and debilitating conditions were also excluded. Those who did not take anti-tuberculosis therapy for ten months in the follow up were also excluded. A questionnaire to know the patient satisfaction was also filled at the end of follow up period. The patients follow up was strictly according to criteria. ESR, LFT's and abdominal ultrasound was done to see any complications or side effects of anti tuberculosis therapy. Fresh x-rays were obtained at the time of study. The loosening of the cage was defined as radiological osteolysis of more than 2 mm around the cage or displacement of the cage more than 4 mm on either antero-posterior or lateral view. All x-rays were scrutinized carefully by two orthopedic surgeons and one radiologist. The operating surgeon did not comment on the x-rays to avoid bias. After careful review of the x-rays the data was entered in the computer for record and analysis.

Results

There were 31 males and 19 females with age ranging from 15 to 70 years. Cage loosening were seen only in one patient (2%). 49 patients showed good results and were disease free. Out of 50 patients in follow up study, twenty six (52%) patients were admitted through outpatient department and twenty four (48%) patients through accident and emergency department.

Males predominated who were 60% and 40% were females. The ratio between male to female was 1.5:1 Minimum and maximum age of presentation was 15 years and 70 years respectively. The mean age was 32.57 $\pm$ 14.9 years. The age of 23 patients (46%) was 36-45 years, age of nine patients (18%) was 46-55 years, age of 14 patients (28%) was 26-35 years and the age of 4 patients (8%) was 56-70 years. In the present study, backache was present in all patients (100%). All patients complained of diffuse pain in thoracic region, mild to moderate in intensity, gradual in onset which was more at night. Fever was present in nineteen patients (63.3%). It was mild to moderate in intensity usually not increased beyond 100 ° F. In none of patients, it was continuous in nature, persisting for a few hours during the day or night. There was no specific time of fever. Clinically all patients were pale (100%), were unable to walk associated with loss of control on bladder and bowel functions.

Routine laboratory investigations were available for 30 patients. Haemoglobin in twelve patients (40%) out of thirty was below 10 gm%, while rest of the patients had normal haemoglobin. Patients with less than 10gm% were considered as anemic. In 8 patients (26.7%) out of thirty, total leukocyte count was raised (more than $10x10^9$/liter). In all these cases, polymorph count was high, while lymphocyte count was normal. All patients (100%) had raised ESR. Mean was 71.63 mm/hour. Mantoux test was done in all cases. It was positive in twenty two patients (73.3%). An induration of 10 mm was taken as positive at end of 72 hours. Blood urea, creatinine and LFTS were performed in all patients before and after anti-tuberculous therapy (ATT) and during treatment once a month.

Discussion

Although various approaches to the surgical management of spinal tuberculosis have been described, many patients in whom medical management has failed have been treated by debridement with or without grafting or internal fixation.[11] If debridement is supplemented with strut grafts and a prolonged course of chemotherapy is given the resultant deformity can be prevented.[12] Graft dislodgement and slippage has been a persistent problem in these cases. Major concern in the treatment of caries spine includes the reduction of bone stock in diseased bone and an appropriate device to mechanically support the vertebral column, weakened by caries.[13] Titanium mesh cages were developed to prevent these problems. Titanium cage appears to be aptly suited for application in patient with severe kyphotic deformity.[14] From mechanical point of view, anterior column should be appropriately approached anteriorly without any violation of the middle and posterior columns. The current choice of implant is titanium cage with appropriate and proper fixation to the vertebral end-plate. The anterior debridement, bone grafting with stabilization of spine using titanium mesh cage instrumentation has been proved to be a reliable procedure.[15] Titanium cage obviates the need for tricortical graft substitutes and avoids their associated risks. The placement of cages has been proven to have a lower hardware related complication rate than those associated with fibular strut grafts or tricortical iliac crest grafts.[16] Titanium mesh cage augmentation is a well established procedure for the surgical treatment of caries spine.[16] Clinical improvement was seen in all patients in this study who underwent surgery. The outcome in those patients who presented within 3-4 months of paraplegia was

better than those who came late.[17,18] In the developing world, we should not be deterred by the duration of paraplegia and should offer such patients at least anterior decompression and titanium cage fixation with chemotherapy[19] regardless of the duration of paraplegia which is likely to arrest further progression of the deformity even if the paraplegia does not improve due to undue delay.[20] Loosening of cage was seen in only one patient in our study.

Conclusion

Cage fixation is the preferred surgical treatment in tuberculosis of spine. No statistically significant evidence of cage loosening has been seen in this study. It is recommended to use titanium mesh cage.

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