Clinical Observation of Pyogenic Osteomyelitis of the Spine

— A Report of Four Cases —

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INTRODUCTION

The earlier Wilensky (1929), Kulowski (1936), and Trueta (1944) reported the pyogenic osteomyelitis of the spine, and Hense & Coventry (1965) reported 185 cases. Garcia (1960) 40 cases, Gilmour (1962) 328 cases, Chung and Lee (1964) 4 cases, Chung et al. (1966) 10 cases, and Kim et al. (1971) 4 cases.

In this report four cases of pyogenic osteomyelitis of the spine treated at the Department of Orthopedic Surgery, the National Medical Center, Seoul, Korea during the years in 1959 to 1971 is presented with brief discussion.

CASE PRESENTATION

Though the incidence of pyogenic spondylitis as well as tuberculosis of the spine have been considerably reduced in late years in this country. However, pyogenic spondylitis still give rise a problem for orthopedic profession to establish proper diagnosis, and subsequent treatment.

Case 1: A 42-year-old farmer visited Out Patient Clinic in September 1969 with chief complaint of low back pain as well as limited motion of the back.

The brief history revealed that in June 1958 pain developed incidiously on the mid back associated with generalized fever, and shortly afterward abscess was formed on the back. The abscess was treated with incision and drainage and healed. The following four months he was not able to lie on his back due to pain on the back, and he could manage only walking for toilet.

Physical examination showed a slight gibbus on the thoracolumbar junction, where upon tenderness was demonstrated and no abnormal neurologic findings were observed.

Roentgenogram showed a deformed contour with destructive changes in the lower part of the Th 12 and the upper part of the L1 bodies with narrowing of the intervertebral space and with lateral bridge on the right side. Chest was free.

Serial sedimentation rate were over 100 upto 130 mm/h. Direct smear and culture of acid fast bacillus in the catheterized urine were negative.

The impression was a pyogenic osteomyelitis of the spine. In order to remove the lesion and to establish the diagnosis, radical curettage was performed through costotransversectomy in January 1960. Small amount of yellowish, thin pus and some amount of granulation tissue were found from the focus.

Bacteriology report from the operative specimen proved Staphylococcus aureus which was sensitive to Aureomycin, Tetracycline and Terramycin. And acid fast bacillus was not proved. Histopathology revealed a picture of nonspecific chronic osteomyelitis.

After the operation the patient was treated with Aureomycin. One week after the operation he became able to be up and about, and he was disch-
arged 15 days after the operation. The back pain completely subsided three months after the operation and confirmed to be completely healed.

**Case 2:** A 53-year-old farmer visited in November 1959 with chief complaint of low back pain as well as paresthesia on both lower legs. From 1926 to 1946 he had a typhoid fever, malaria, gonorrhea and edema on both legs.

The brief history revealed that sudden severe low back pain associated with high fever and headach occurred in October 1955, and he was bed-ridden for following 11 months. He was diagnosed as a tuberculosis of the spine at other hospital in 1956, where he was treated with regular antituberculous medication and plaster bed for four months, thereafter his back pain became somewhat improved, and he was able to be up. However, he was not recovered enough to work on his farm.

Physical examination revealed stiff thoracolumbar spine with tenderness on L1 and L2. Achilles tendon reflex was abolished in the left side. Other neurological examination were within normal limits.

Roentgenogram revealed a bony destruction with deformed contour L1 and L2 vertebrae were blocked together with bone and a tiny cavity was observed. No paravertebral abscess shadow was detected. The findings was most likely to be a burnt out inflammation of the vertebrae. Chest was free.

Sedimentation rates ranged from 52 to 55 mm/h.

Radical curettage was performed in February 1960, approached through transversectomy. Pus was evacuated from the paravertebral abscess, which extended from Th 12 down L3 and number of sequela and granulations were found in cavity of L 1-2 and L 2-3. Bacteriological culture from the specimen had proved Staphylococcus aureus. And acid fast bacillus was not proved. Histopathological examination had revealed a subchronic nonspecific inflammation.

After the operation the case was treated with proper antibiotics proved by the sensitivity test such as Aureomycin and Terramycin. He was discharged and walked out from the ward 10 days after the operation. Four months after the operation he was observed to be free from back pain. However, at the same time he was diagnosed as an incurable bilateral chronic glomerulonephritis with findings of anemia, hypertension, azotemia and poor functioning kidneys.

Successive study with urine and discharge from the draining sinus were failed to confirm the acid fast bacillus. No further follow-up observation was performed.

**Cases 3:** A 6-year-5-month-old boy visited in March 1960 with chief complaint of pain in the right hip with a marked flexion contracture associated with walking inability and in the right quadrant of the abdomen.

The brief history revealed that these symptoms occurred in association with walking disturbance due to a marked flexion contracture of the right hip and generalized fever in September 1959. No treatment had been given until he visited Out Patient Clinic.

Physical examination revealed a loss of physiologic lumbar lordosis with tenderness on the right sacroiliac region, and a child’s fist sized tender mass in the right iliac fossa. The right hip had 95 degrees flexion contracture. Knee and ankle jerks on the both sides were diminished. No other abnormal neurologic findings were noted.

Roentgenogram revealed a huge psaos abscess shadow on the right side, on the other hand no pathologic findings was observed in the lumber spine.

Antituberterlcous medication was started at once at the Out Patient Clinic. In spite of regular antituberculous treatment for 6 months, a mass was gradually grown on the left lumber region, where upon a draining sinus developed. During the same period of time, another draining sinus developed on the right upper arm.

He was admitted in August 1960 because his general condition was getting worse. On admission a marked distended abdomen was observed. The spine had a slight kyphosis with abscess and draining sinus on the lumbar region. Another draining sinus was observed on the right upper arm. The right hip had 30 degrees flexion contracture. The successive three times of Mantoux test were all negative.

In August 1960 roentgenogram revealed a destructive changes and collapsed bodies of the L4 and L5
vertebrae with no shadow of the psoas abscess, and pyogenic osteomyelitis was found in the right humerus.

Bacteriology report of the pus taken from the draining sinus on the lumbar region proved Staphylococcus aureus. Sedimentation rate was 56mm/h, and white blood corpuscule 15400/mm³.

In order to remove the lesion and to establish the diagnosis, radical curettage of L4 and L5 was performed through the transperitoneal approach in November 1960. The psoas abscess was not found. A small amount of granulation tissue was curedtted out from a cavity. Bacteriology study of the operative specimen had not proved either pyogenic bacteria or acid fast bacilli.


On the second admission in September 1961 the right psoas abscess was evacuated. Serial culture for ordinary bacteria proved Staphylococcus aureus, beta hemolytic Streptococcus, and Colliform bacillus. On months after the second operation his physical activity recovered completely, however the draining sinus was not completely closed. Sedimentation rate was 56mm/h.


Brief history revealed that a gradual mid back pain occurred in October 1970 with no fibrile episode. She could hardly manage her daily work and mid back pain was followed by walking.

Physical examination on admission in March 1971 revealed a slight round kyphosis in the lower thoracic spine, and the motion of the spine was considerably restricted. Marked pain and tenderness on Th 11 and Th 12 region were noted. No abnormal neurologic findings were noted.

Roentgenogram revealed an almost missing of the intervertebral space between the Th 11 and Th 12. Tomography revealed an oval shaped, well defined cavity on the midportion of the lower part of Th 11 and of the upper part of the Th 12. It was surrounded by sclerosis. Sedimentation rates were ranging 60 to 71mm/h and white blood corpuscles were 7900/mm³.

She was treated with regular antituberculous medication for 5 weeks before the admission, however, her symptom was not improved. The impression was nonspecific spondylitis and the operative intervention seemed to be the best treatment to facilitate the healing. Partial resection of the Th 11 and Th 12 with anterior spinal fusion through thoracoabdominal approach was performed in March 1971. Protrusion of the pleura along the left side of the Th 11 and Th 12 was observed, and this mass was filled with fibrosis and granulation tissue. The intervertebral space between the Th 11 and Th 12 was almost completely missing, and vertebrae were kissing. A rectangular shaped bone was chiseled away, and a big cavity was found, which contained a good amount of pus and granulation. The wall of the cavity was very smooth and sclerotic.

Bacteriology culture from the specimen proved Pseudomonas aeruginosa and acid fast bacillus was not proved.

Histopathology revealed a chronic non-specific inflammation with focal necrosis, and no evidence of tuberculosis was found.

After the operation she was bedridden in a plaster bed for one month, thereafter changed into a Taylor back brace and started to be up and about. The brace was used for two weeks and discarded. She recovered full physical activity from three months after the operation. She was confirmed to be completely healthy in the spine up to five months observation after the operation.

**DISCUSSION**

Pyogenic osteomyelitis of the spine is still raising a problem for orthopedic profession to establish proper diagnosis in this country. Some authors advocate conservative treatment, however surgical intervention is required frequently in order to establish and to cure the disease.

The incidence of the disease according to age group varies widely in the literature. Makin and Abott(1896) had higher incidence in the age group
of 14, and that of Kulowski (1936)\(^5\) was 31 years of age, and that of Chung et al (1966)\(^1\) was 21 to 31 years of age. Male had higher incidence than female.

Batson (1942) advocated the lumbar spine was involved most frequently because the infection in the pelvis and genitourinary system spread to the lumbar spine through the Batson's plexus. Waldvogel (1970)\(^5\) agreed him in the adult. Hensen and Coventry (1966), Garcia (1960)\(^5\), Chung et al (1966)\(^5\) and Waldvogel (1970)\(^5\) agreed the incidence was higher in the order of the lumbar, thoracic, and cervical spine. Sacrum and coccyx were rare. In this series the lesion were evenly distributed from Th 11 down to L5.

In the relevant literatures Staphylococcus aureus is the most common causative microorganism of the disease, and in far less incidences Escherichia Coli, Pseudomonas, Salmonella and Streptococcus are the causative bacteria. Mixed infection was reported to be frequent by Hansen and Coventry. Garcia had 10 per cent of Streptococcus and Pseudomonas infections among his 40 cases. In this series three cases were caused by Staphylococcus aureus and one case was Pseudomonas.

As to the differential diagnosis particularly from the tuberculous and Salmonelll spondylitis, Waldvogel and Meschan relied mostly upon the roentgenography. We have an impression the roentgenography as well as high sedimentation rate are of value to differentiate particularly from tuberculous spondylitis.

Wiler (1959) and Stone (1963)\(^7\) recommend medical treatment with proper antibiotics together with immobilization of the lesion with plaster cast, on the other hand David (1964)\(^7\) reported good results treated with surgery and immobilization as well as administration of antibiotics. In this report all the four cases were treated with surgery and antibiotics administration.

**SUMMARY**

1. Four cases of pyogenic osteomyelitis of the spine treated through the years 1969 to 1971 are reported.

2. In all the four cases diagnosis were confirmed by the surgery.

3. Altogether eight vertebrae were involved, and evenly distributed from Th 11 down to L5.

4. Sedimentation rates ranged from 52 to 130 mm/h.

5. Three case were completely healed leaving a tiny sinus in one case. One case was almost healed, on the other hand, all the cases recovered full physical activities.

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國立醫學院 整形外科

<科長 安 征 整 >

朴勝圭・樸七秀・金基容

國立醫學院 整形外科에서 1959年 부터 1971年까지 治
면한 화농성 컴퓨터 4례에 관한 증례 보고를 하였다.
1. 3례는 성인이고 1례는 소년이다.
2. 3례는 남자이고 1례는 여자였다.
3. 연구 대상은 11위부터 5위 및 뒷 부위까지 분포되었고
   관절 손상은 8례이고 3례, 5례가 있다.
4. 감염 유래로는 3례에 Pseudomonas가 1례
   이었다.
5. 검사 양상 중으로서 알콜 지속가 시간 50에서 130mm/h
   까지 이르렀다.
6. 증례에서 수술로써 진단을 확대로하였다.
7. 3례에서는 전위 회복술, 1례에서는 장구 부분 개방술
   에서 농해 흐름사 숭을 시행하였다.
8. 3례가 완치되었고 1례는 근력재생에 1례에서는
   정상의 흐름사 숭이 흐름하다. 전례에서 회복은 완전
   되었다.
Fig. 1. Case 4—Preoperative roentgenogram revealed almost missing of the intervertebral space between the Th 11 and Th 12.

Fig. 2. Case 4—Tomography revealed an oval shaped destruction in Th 11 and Th 12.

Fig. 3. Case 4—Five month postoperative control roentgenogram confirmed a good result of anterior spinal fusion.