

Thoracoscopic Drainage of Para- Vertebral Abscess-Report of Two Cases

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Abstract:

Tuberculosis of the spine is common in tropical countries like Bangladesh and it is the most common site of skeletal tuberculosis as a whole. In addition to the anti-tubercular chemotherapy, paravertebral abscess often require surgical decompression. Surgical intervention for the thoracic region needs formal thoracotomy which involves a very long incision over the chest. In this regards, thoracoscopic drainage would have been a good option. Two patients (one 53 years old female and other 20 years old male) with para- vertebral abscess with compression and collapse of vertebral bodies resulting cord compression presented with neurological symptoms underwent video assisted thoracoscopic drainage with biopsy from the abscess wall using a standard laparoscope (as thoracoscope) at the Bangabandhu Sheikh Mujib Medical University (BSMMU), and a private hospital in Dhaka. The patients were fed on 1st post operative day and antitubercular chemotherapy was continued. Post-operative period was uneventful and the patients were discharged on 8th post operative day with antitubercular chemotherapy. There was a gradual improvement of neurological symptoms of lower limbs. Till date the 1st and 2nd patient were followed-up for a period of 18 and 12 months respectively. The condition of both patients improved gradually with no neurological deficit. To the best of our knowledge, there was no previous report of thoracoscopic drainage of para-vertebral abscess from Bangladesh. So this is the 1st report in our country. Thoracoscopic drainage of para-vertebral abscess appears to be a technically feasible, patient friendly modality of treatment for the spinal tuberculosis in experienced hand with excellent cosmetic out come.

Key words : Thoracoscopic drainage, paravertebral abscess

[BSMMU J 2010; 3(1): 35-39]

Introduction:

Skeletal tuberculosis accounts for 5% of extra-pulmonary tuberculosis¹. Vertebral tuberculosis is the commonest form of skeletal tuberculosis and it accounts for about 50% of the tuberculosis of the bone and joints². Even though, it can occur in any age from 1 year to 80 years of age but it is much more common in the first three decades of life^{3,4}. Both sexes are equally affected. Tuberculosis of the spine is quite common in this subcontinent². Recently there, has been rise of the incidence even in the US due to the emergence of the resistance strains. Thoracic spine is the most common site followed by the cervical and the lumbar segment². The disease is always secondary to primary of lungs, lymph nodes or kidneys. A minimum time lag of 2 to 3 years is present between the development of primary focus and manifestation of disease in the spine³. The bacteria may reach the cancellous bone of vertebral bodies

through the arterial circulation or Batson's plexus of veins. Initially 2 contiguous vertebral bodies are involved due to common vascular supply. Destruction of vertebral bodies compromises the nutrition of intervertebral disc and leads to progressive disc destruction and vertebral bodies loose the mechanical strength due to destruction under the force of body weight and eventually results collapse of intervertebral joints but posterior arch remain intact and thus angular kyphotic deformity is produced^{2,3}. Paravertebral abscess formation occurs in almost every cases. With collapse of vertebral bodies, tuberculous granulating tissue, caseous matter and necrotic bone and bone marrow are extruded through the bony cortex and accumulate beneath the anterior longitudinal ligament. Compression of the cord by the abscess or by the caseating or granulating mass or by the posteriorly protruding border of disc or edge of bone can result into neurological deficit. Other contributing factors may be thrombosis local vessels and oedema of the cord². In the USA there has been steady increase in the prevalence of pulmonary as well as extrapulmonary tuberculosis. This is largely due to impairment of immune system by the AIDS virus leading

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to reactivation of latent infection and a likelihood of progression to active disease³.

Once the diagnosis is confirmed, antitubercular chemotherapy should be started together with the rest and immobilization. Surgical treatment is indicated for the following condition, progressive bone destruction in spite of chemotherapy, failure to respond to the conservative management, marked increase of the para-vertebral abscess in spite of rest and chemotherapy, development of neurological complication or pain of the spine due to mechanical instability, uncertainty of diagnosis, older patients where prolong bed rest may be hazardous⁴.

Video-assisted thoracic surgery (VATS) has developed very rapidly in the last two decades, and has replaced conventional open thoracotomy as a standard procedure for some simple thoracic operations as well as an option or a complementary procedure for some other more complex operations⁵. Conventional thoracotomy requires a long incision in the chest thereby increases morbidity and may be quite painful. It is felt that thoracoscopy may be employed instead of thoracotomy with gratifying result. There was no previous report of thoracoscopic drainage of para-vertebral abscess in Bangladesh.

Case Reports:

Case-1: A 53 years old female patient presented in early 2008 with marked weakness, fatigue, severe back pain for 2 months and paraplegia for 1 week more marked on left side with involvement of bowel and bladder. She had no constitutional symptoms and was treated with anti-tubercular therapy for the 2 months but her symptoms did not improve. On examination there was localized tenderness of the 7th and 8th thoracic spine. Sense of touch, pain, temperature, vibration and joint position of the lower limb and abdomen were absent up-to T₇. Motor function was grade-0 on left side and grade-1 on right side. Ankle clonus was present. Planter reflex was extensor. Abdominal and cremaster reflexes were absent. Knee and ankle jerks were absent. All routine tests were within normal limit. Magnetic resonance imaging (MRI) of spine findings were almost complete destruction of the D₈ vertebral body and significant destructive changes of D_{7,8} and D_{8,9} intervertebral discs with generalized bulging or fragment causing significant indentation and compression of cord with significant paravertebral soft tissue density from D₇ to D₉ level. Video assisted drainage of the paravertebral abscess was done. Following evacuation of pus, biopsy was taken from abscess wall and chest drain was kept. She was fed on 1st post-operative day and antitubercular chemotherapy

continued. As her condition gradually improved and after removal of her chest drain she was discharged on 8th post operative day with 18 months of antitubercular chemotherapy. After 18 months of follow-up she was able to walk independently and radiologically her spine was much better.

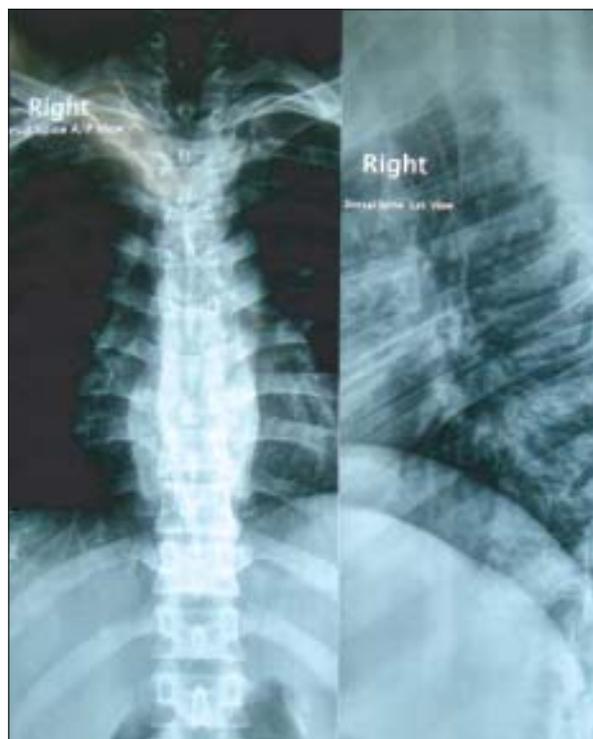


Fig-1: X-ray chest & dorsal spine showed para-vertebral abscess

Case-2: A 20 years old male patient presented with severe pain over back of chest for 2 months and loss of sensation and weakness of both lower limbs for 2 weeks before admission. The weakness gradually increased and for the last 4-5 days he could not stand or walk without any support. He had no constitutional symptoms. On examination there was Gibbus on the thoracic spine which was tender. Sense of touch, pain, temperature, vibration and joint position of lower limb and abdomen were absent up-to T₇. Motor function was grade-2 on both sides. Ankle clonus was present. Planter reflex was extensor. Abdominal and cremaster reflexes were absent. Knee and ankle jerks were exaggerated. All routine tests were within normal limit. MRI of spine findings were destruction of the D₇ vertebral body and significant destructive changes of D_{7,8} and D_{8,9} intervertebral discs with generalized bulging or fragment causing significant indentation and compression of cord with significant paravertebral soft tissue density from D₆



Fig.-2: MRI showed para-vertebr abscess with destruction of vertebral body

to D₉ level. Video assisted drainage of the paravertebral abscess was done. Following evacuation of pus, biopsy was taken from abscess wall and chest drain was kept. He was fed on the 1st post-operative day with antitubercular chemotherapy. As his condition gradually improved he was also discharged on 8th post operative day after removal of the chest drain with advice and regular follow-up. After 12 months of follow-up he was able to walk independently and radiologically his spine showed significant improvement.



Fig.-3: Para-vertebral abscess with harmonic knife.

Operative procedure:

Under general anaesthesia the patient was placed on right lateral position with left lung collapse (Single Lung Ventilation). The monitor was placed at the back of the patient near the shoulder with surgeon and the camera assistant on the front side of the patient. Three ports were used. One 10mm port was in the right anterior axillary line at the 5th intercostal space for the telescope and two 5mm

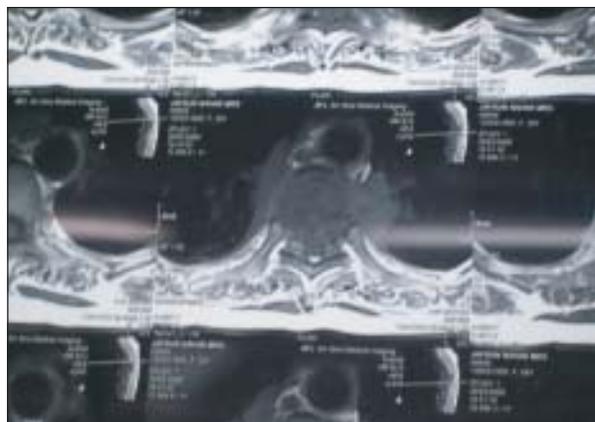


Fig-4: Biopsy taken from the abscess wall.

ports at the 3rd and 6th spaces were at right mid-clavicular line and right mid-axillary line for working of the surgeon. Once the left lung was collapsed, the paravertebral abscess was located at the left side of thoracic 7th and 8th discs. The capsule of the abscess was incised with the harmonic knife and white thick materials came out. Once a sample was taken for the culture and sensitivity and pus was aspirated and space irrigated with normal saline. Then biopsy was taken from abscess wall and the ports were closed after putting a chest drain (under water seal drain).

Discussion:

Video-assisted thoracoscopic drainage of para-vertebral abscess is one of the best option of management of tuberculosis of spine with paravertebral abscess specially thoracic spine⁵. Tuberculosis of the spine is common in the Sub-continent and is the most common site for skeletal tuberculosis. A 53 years old female presented with para-vertebral abscess with collapse of vertebral bodies with cord compression with neurological symptoms like Pott's paraplegia with bowel and bladder involvement was on

two months of antitubercular chemotherapy without improvement. The second patient was 20 years old male also presented with neurological symptoms without Pott's paraplegia or bowel and bladder involvement or antitubercular chemotherapy. Video-assisted thoracoscopic drainage of para-vertebral abscesses with biopsy of the abscess wall were done. Both patients were improved without any residual deficit and similar encouraging reports were also published by the other authors⁶. Following video-assisted thoracoscopic drainage of para-vertebral abscess or prevertebral abscess with debridement, debridement and decompression some form of internal fixation is often required in the form of anterior or posterior screw-rod fixation or with reconstruction with rib graft or anterior vertical titanium mesh cage⁷ but in this series internal fixation was not attempted.

The application of thoracoscopy can be traced back to one hundred years, when Dr. Jacobaeus 1st reported his experience in the diagnosis and treatment of pleural effusions by thoracoscope in 1909⁸. Most patients who needed to undergo thoracoscopy at that time suffered from pulmonary tuberculosis (TB) (the era of enthusiasm)⁹ and was rarely performed after development of chemotherapy for patients of TB after 1950s (the era of neglect)¹⁰. The development of fibro-optic light transmission, the illumination and the image processing techniques, as well as the refinement of related instruments made video-assisted thoracoscopy more easily and broadly applied after the 1990s (the era of revolutions and rapid development)^{11,12,13}. Now video-assisted thoracic surgery (VATS) has become a basic and important technique for a thoracic surgeon. The minimal requirements of VATS include a zero-and/or 30⁰ rigid telescope, a light source and cable, camera and an image processor¹⁴. The optical devices like a slave monitor, a semi-flexible telescope and a video-recorder¹⁵ which are the additional adjunct. The 30⁰ angled viewing scope can help to check the whole pleural cavity with broader visual field¹⁵ which is similar in our study. The recommended light source and the output power for video-assisted thoracic surgery are inert gas (e.g. Xenon) mediated cold light at 300 W higher than used in other endoscopes¹⁶. The reason why VATS needs higher light output power is that blood in the operation field will absorb up to 50% of light^{16,17}. But xenon light source is not available in the authors practice so halogen light source was used. Regarding the cost analysis of

VATS, selection criteria, general hospital charges, post-operative morbidity or mortality, duration of chest tube drainage and length of hospital stay, outpatient management and long term benefits or complications should be considered¹⁸. The cost, hospital stay and morbidity were less than formal thoracotomy.

Post-operative period was uneventful and the patients were discharged on 8th post operative day with 18 months of antitubercular chemotherapy with post-operative advice and regular follow-up. 1st patient was followed-up to 18 months and she improved without any residual deficits. 2nd patient was followed-up to 12 months and he had no residual defect either. Thoracoscopic drainage of para-vertebral abscess appears to be a technically feasible, patient friendly modality of treatment for the spinal tuberculosis in experienced hand with excellent cosmetic outcome. However internal fixation may be needed in some cases which would be more complex but technically demanding.

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