Development in the management of tuberculosis of the spine

Myung-Sang Moon

Spine Center, Sun General Hospital, Daejeon, Republic of Korea
Moon Kim’s Institute of Orthopaedic Research, Seoul, Republic of Korea

KEYWORDS
Tuberculosis; Management; Development; Spine

Summary
The history of the management of spinal tuberculosis is closely linked with the development of civilization. The author describes the development of antituberculous medicine and surgery, based on the era of medical art and science. Also the author describes the bacteriological behaviour of \textit{tubercle bacilli} and drug response, and the expected development of surgery of tuberculosis of the spine.

Introduction
Goals in the management have changed significantly during the last two centuries as a result of rapid and remarkable advances in science, particularly during the second half of the 20th century.\textsuperscript{1-13} It was once thought that the demand for spinal deformity prevention and correction was a luxury. Even as late as 1970s the primary goal of the management was to save the patients’ life by curing the disease rather than prevention and/or correction of the deformity the surgeons till this time, had no solutions to meet the patients’ aesthetic demand which has grown gradually and become more intense since early 1980s. This period was also one of economical growth.

Antituberculous drugs changed the patients’ fate. It was soon realized that the specific chemotherapeutic agents alone could cure not only active tuberculosis but it also helped in the recovery from paralysis.\textsuperscript{11,14,15} The operative treatment was reserved for: (1) failure of the drug therapy, (2) recrudescence of the disease, (3) Pott’s paraplegia that did not resolve after 4-6 weeks of chemotherapy, (4) involvement of spinal cord, or (5) other complications. Antituberculous drugs also made the surgery safer.

Historical background
The history of the management of spinal tuberculosis is closely linked to the development of civilization and economic growth in each country and each continent. The change started in the 19th century when old fashioned artistic medical practice slowly changed into scientific medicine. In the 19th century most practitioners used...
'home methods' for treatment as scientific progress had not reached all corners of the tuberculous zone. Pseudoscientific theories were rampant and popular.

The contribution of Lister (surgery), Pasteur (bacteriology), Morton (anesthesiology), and Roentgen (X-rays) helped us to enter the medical science era in the 20th century. However, there was no progress in the development of specific anti-tuberculous drugs and surgery could not make any steady progress. The revolution produced later by chemotherapy relegated all traditional methods of conservative treatment of spinal tuberculosis to the museum. Even today, specific drugs are a most important weapon in the management of tuberculosis.11,14

In the ancient Indian religious text [Rig veda and Atharva veda; (3500–1800 BC): Samhita of Charaka and Sushruta (1000 and 600 BC)], tuberculosis was described as 'Yakshma' and 'Sipudru' was prescribed for spine tuberculosis, abscess and local inflammation, while 'Jangida' was prescribed for 'Yakshma' and also for persistent cough, pleurisy, lumbago, and rheumatic pain.

In the ancient Hindu religious text there are descriptions about the traction treatment for hunchback.15 In 1570, Delechamps clarified the relationship of spine caries and lower limb paralysis2,12,16,17 but he did not mention the solution to the limb paralysis. In 1672 Wiseman used the scalp for abscess drainage which is the first record in the world literature.16,17 Abscess drainage was known to be practised by the barber’s surgeons or the folk medicine practitioners in many countries during the medieval era.

Abscesses were drained by any sharp instrument including the sharp edge of a broken ceramic dish or vase.18

### Principles of management of spinal tuberculosis

It is felt that the historical review of developments in the management of the spinal tuberculosis is timely in the era of the resurgence of the spinal tuberculosis associated with the world-wide spread of the human immunodeficiency virus disease (HIVD). It is more reasonable to explain the development of the management of the spinal tuberculosis based on the advent of the modern antituberculous chemotherapeutic agents. I have classified this into two eras: pre-chemotherapy and chemotherapy eras (Tables 1–3).

Measures for management of the disease have been urgently needed, primarily to save life, and secondly to arrest or cure the disease. The progression of disease causing destruction and deformity needed to be halted and prevent and overcome the dreaded neurological complication of ‘paraplegia’.

We surgeons have to be prepared for the possible recrudescence of the disease in later years. In a disease as treacherous as tuberculosis, it is better to avoid the term ‘cure’ when the patient with advanced disease is treated by chemotherapy alone, regular follow-up is mandatory to

| Table 1 Development in the management of tuberculosis of spine, based on development of science. |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| **Concentrations** | **Era of medical art (natural cure)** | **Era of Medical science (medical cure)** |
| Before and 16th | 17th | 18th | 19th | 20th | 21st |
| Pre-chemotherapy era | Pre-surgery era | Quasi-surgery | Chemotherapy era (surgery era) |
| --- | --- | --- | --- | --- | --- |
| **Surgery**: | **Posterior fusion** | **[1611: Albire 1913]** | **Anterior surgery (1934): Hodgson & Stock (1956)** | **Chemotherapy (1940: curative)** | **Surgery: successful (1957)** |
| **Spine caries and lower limb paralysis (1570)** | **Tuberculous nature of gibbus spine**: | **Hippocrates, Galen**: | **Platner (1744): Tuberculous nature of gibbus spine**: | **Jean Pierre Douat (1778): Various types of spinal deformities**: | **Sime: RE (1763): Salk** |
| **Royal touch (Shah’s evil) for scoliosis** | **Antropalgi (1803)** | **Lumbar wedge (1890):** | **Anesthesia (1824)** | **Henry Hichman (1824)** | **Anesthesia** |
| **SM (1944)** | **Triad** | **PAS (1946)** | **DNR (1951)** | **PRZ (1956)** | **DF (1963)** |
| **Short-term**: | 6–9M | **Long-term**: | 12–13M |
| **Decompression** | **Posterior (cristo)** | **Anterior** | **Combined** |
| **transcomtectomy** | **s o r o i n str u m en t a l e a (p o s t e r i o r )** |
diagnose the relapse. Treatment should be prolonged and a cautious attitude maintained for many years.

**Conventional conservative management**

This management is nowadays purely a supplementary one though once in the medieval times evil-spirit chasing rituals, royal touch for King’s evil (scrofula) and other folk remedies were practised. Until the mid 20th century patients and physicians depended on nature to heal tuberculosis.

**Classification of the conservative management**

I have classified the conservative management as follows:

1. **Spiritual and religious methods** (evil chasing ritual, Royal touch for Kings’ evil): Those belonged truly to psychological treatment and not to physical or medical treatment.

2. **Non-drug management**: For many centuries patients and physicians depended on the natural healing through exposure to sunlight, fresh air, maintaining good hygiene, taking good food and rest, etc. This kind of management was systematically practised through sanatorium care from mid 19th century till the early 1980s.

Now those measures are not in reality used any more for care of spinal tuberculosis except the hyperalimentation measures.

In the pre-chemotherapy era, the disease progressed and produced various complications leading to deterioration in the patient’s general condition and sometimes many cases were fatal.

3. **Drug management**: Any combination of all of the non-antituberculous drugs were used for pure supplementary purposes such as pain alleviation and nourishment.

In the Western world the extract of the willow bark or leaves (salix) was used for pain and fever by Stone in 1763. In 1853 acetylsalicylic acid (ASA) was synthesized by Gerherdt. ASA was used for pain alleviation in the early days, but since 1987 it is used for early bone tuberculosis, not only to suppress the inflammatory process but also to prevent bone absorption through the inhibition of prostaglandin E2 synthesis. I use ASA for 1–3 months even in the era of chemotherapy.

4. **Local supportive measures**: In the pre-chemotherapy era, external spinal support measures were introduced for spinal tuberculosis in the late 19th century and were used until the advent of chemotherapy. Immobilisation by bed rest and body support or posterior spinal fusion (Hibbs and Albee, 1911) provided the local stability conducive to healing of the lesion. The revolution produced by chemotherapy has relegated all traditional methods of

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Development in the management of tuberculosis of spine, based on development of science.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Centuries</strong></td>
<td><strong>En of Medical art (natural cure)</strong></td>
</tr>
<tr>
<td><strong>Medieval</strong></td>
<td>17th</td>
</tr>
<tr>
<td><strong>En of pre-chemotherapy</strong></td>
<td>quasi-surgery</td>
</tr>
<tr>
<td><strong>Sanatorium</strong></td>
<td>Chemotherapy (1940)</td>
</tr>
<tr>
<td><strong>Non-sanatorium</strong></td>
<td>home care</td>
</tr>
<tr>
<td><strong>Non-isolation</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Folk medicine (remedies)</strong></td>
<td></td>
</tr>
<tr>
<td><em>Shamanic ritual: Royal touch → church prayer</em></td>
<td>Crude drug → extract (herbs)</td>
</tr>
<tr>
<td><em>Willow bark and leaves</em></td>
<td><em>Jangidha</em> in India</td>
</tr>
<tr>
<td><strong>Preventive medicine:</strong></td>
<td></td>
</tr>
<tr>
<td><em>Prophylaxis</em></td>
<td>isolation</td>
</tr>
<tr>
<td>B.C.G.</td>
<td>Screening</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td></td>
</tr>
<tr>
<td><em>Non-surgical:</em></td>
<td></td>
</tr>
<tr>
<td>Non-drug therapy</td>
<td>rest</td>
</tr>
<tr>
<td>cast, brace</td>
<td>chemotherapy</td>
</tr>
<tr>
<td><em>Surgical:</em></td>
<td></td>
</tr>
<tr>
<td>scalp drainage (1762)</td>
<td>posterior surgery (1911)</td>
</tr>
<tr>
<td>anterior surgery (1934)</td>
<td>decompression (1950)</td>
</tr>
<tr>
<td>deformity correction (1974)</td>
<td></td>
</tr>
<tr>
<td><em>Instrumentation (1981)</em></td>
<td></td>
</tr>
<tr>
<td><strong>Menant (1885):</strong></td>
<td>Drainage for paraplegia</td>
</tr>
<tr>
<td><strong>Posterior approach (1935):</strong></td>
<td></td>
</tr>
<tr>
<td>debridement &amp; fusion (1956)</td>
<td>Halo–pelvic traction</td>
</tr>
<tr>
<td>(1971)</td>
<td>Two stage operation (1981)</td>
</tr>
<tr>
<td>Decancellation</td>
<td>Wedge resection</td>
</tr>
</tbody>
</table>
conservative treatment to the museum. However, those methods are still widely used in certain countries. Those doctors still have reluctance to abandon traditional methods, and have advocated a 'middle path' regimen, combining the chemotherapeutics with rest on a hard bed or plaster bed.17

5. Chemotherapy: With the advent of specific antituberculous chemotherapy (SM in 1944, PAS in 1946, INH in 1951, PRZA in 1952, RF in 1965 and ETB in 1961) the clinical course of tuberculosis has been changed so much that the patients no longer die but are cured. The period of infectivity was considerably reduced, relapses were avoided and the chronicity was reduced.

In the pre-chemotherapy era surgery for active spinal tuberculosis failed in the majority of cases because surgery could not eradicate the infection. In the chemotherapy era all surgery for active spinal tuberculosis is done under the cover of chemotherapy and the results are successful in eradicating tuberculosis and preventing and/or correcting spinal deformities.8,12,20,22,23

Chemotherapeutic agents are clearly known to be the most potent weapons in curing the tuberculosis and surgery was definitely found to be the supplementary one. However, surgery has made constant advancement, solving the patients’ complaints by curing the disease and its complications.

During the early stage of its development the aim of surgery was purely to cure the disease but was unsuccessful. At a later stage surgery aimed to treat the disease-related complications and involved spinal decompression for the limb paralysis, stabilization for the affected unstable spine and correction surgery for deformity.8,12,20,22,23

It must be borne in mind that any surgery for the management of spinal tuberculosis could not succeed without chemotherapy.

The question of the choice of treatment of uncomplicated spinal tuberculosis had been largely answered by a series of controlled clinical trials carried out by the British MRC working party since 1964 to 1970. During this period the responsible opinions on the best method of treatment varied widely. Since the advent of chemotherapy, there has been tremendous change in the treatment protocol.

Until 1970, the classical 'first line' drugs (streptomycin, INAH, PAS), the original triple therapy, were used. Rifampicin, ethambutol and pyrazinamide were added later. PAS was gradually eliminated in drug combination in view of its side effects. Now three or four drug regimens include four second line drugs (INAH, rifampicin, ethambutol, pyrazinamide). Three drug regimen had been the principal formula but since 1990 four-drug regimen has been adopted to shorten the duration of drug administration and to eradicate the resistant strains.

Even today there is no standardised drug regimen applicable to every patient, although an 'acceptable regimen' has been suggested.

Duration of drug administration is still an issue: 6, 9, 12, 18 or 24 months, though in most instances 9–12 months chemotherapy has been adopted for spinal tuberculosis.
In 1994 Upadhyay reported that 9 months short course chemotherapy was successful in patients undergoing anterior radical surgery while others are still insisting on the 12 months chemotherapy, particularly in the non-surgically treated cases.14,25

Dormant bacilli:
Treatment of the dormant mycobacterium in the tuberculous lesion is a problem, because it does not completely respond to drugs. This is the cause of a relapse or a reactivation. As a result of very slow oxygen deprivation the mycobacterium in the tuberculous lesion becomes dormant. My suggestion as the first step is to awake the dormant bacilli through hyperbaric oxygen therapy and the increase of local circulation. Frequent hyperbaric oxygen therapy and oral prostaglandin E2 administration (Opalmon 5μg, 3 times daily) have been used by me.

To label the patient as a non-responder, based only on the drug response after a fixed duration, is unfair and unconvincing.

There have been the two different criteria for drug response assessment for non-paralytic and paralytic patients. For the former, drug response was assessed at 3 months while for the latter it was assessed at 3–4 weeks.

At present, the known preventive measures for the drug resistant strains are:

1. Consistent use of two or more effective agents.
2. Drug resistance usually reflects failure of a treatment programme; failure of adherence to therapy, as increase of the dose for 3–4 weeks and/or change of chemotherapy formula.

To combat multi-drug resistant tuberculosis, it is essential to develop a novel anti-tuberculous composition of the drugs. Where do we go from here?

We have to consider the adjunctive immunotherapy (immunopotentiation) which may also have a role in successfully treating spinal tuberculosis especially in HIV and other immunocompromised patients.

Anti-tuberculous drugs changed the surgical approach to spinal tuberculosis.11 Surgery is only an augmentation to chemotherapy, and is not the key treatment. Surgery in tuberculosis has contributed significantly to improving the quality of patients’ lives and in meeting the patients’ aesthetic demands.

The Hong Kong surgeons claimed that radical surgery with chemotherapy gave excellent results in their hands and felt that it was the obvious answer to spinal tuberculosis. They also stressed that healing must be accompanied by fusion.8 At the other extreme, Konstam and others impressed on us the excellent results of outpatient ambulant chemotherapy with or without spontaneous fusion.26 My personal experience supports this latter view.

There are two reports on spontaneous fusion.14,26 One report said that chemotherapy alone brought about the stability of the affected segment through spontaneous fusion within 5 years and the other report said that in the untreated children with spinal tuberculosis spontaneous bony ankylosis took a longer time, average 9 years, during which period more severe deformity developed with luxation.

Development of surgical management

In the era of medical art, Menard in 1895 decompressed an abscess surrounding the spinal cord and was delighted to find that the patient recovered neurologically.27 Also two surgical procedures (posterior fusion introduced by Hibbs and Albee in 1911, and anterior surgery by Ito et al. in 1934)1,2,5 could not bring about successful results, because the two operations were fraught with danger at every stage due to lack of specific antituberculous chemotherapeutic agents (Fig. 1).

Mukopadhya in 1956 was probably the first orthopaedic surgeon to recognize the usefulness of chemotherapy for skeletal tuberculosis and this reduced the numbers of operations performed.11

Thanks to the advent of chemotherapeutics in the 1940s, the surgical procedures started becoming extremely successful.8,10,12 Many new surgical techniques were introduced not only to treat the disease, but also to treat the complications of the disease in a safer and more effective manner.8,13,24,28

Incisional drainage of abscess

In 1672 Wiseman used a scalpel for abscess drainage which was the first record in the world medical literature.16 However, abscess drainage has been known to be practised by the barber surgeons or folk medicine practitioners in many countries since the pre-medieval era.

Old dictum of where there is pus, let it out, is only acceptable when it is associated with pressure symptoms. So it is good surgical practice to undertake aseptic evacuation of an abscess. However, it must be kept in mind that incisional drainage of a tuberculous abscess results in continuous wetting of the dressing for a much longer period, much to the discomfort of the patient.

According to a literary review, in 1570 Dalechamps clarified the relationship of spine caries and lower limb paralysis, but he did not mention the solution for the limb paralysis.16

In 1895 Menard decompressed an abscess surrounding the spinal cord and was delighted to find that the patient recovered neurologically.27 This led him and other surgeons to decompress the spinal cord through a variety of posterolateral and anterolateral approaches. At that time even if the patients had aseptic surgery under current anaesthesia, some patients still showed further destruction of bone, paralysis and spread of the disease.15 This happened in the absence of chemotherapeutic agents.

Posterior spinal fusion (extrafocal bone grafting alone)

This procedure was introduced at the turn of the 20th century by Hibbs and Albee in 1911, drawing the surgeons’ attention. However, it was shown quite clearly in 1937 by McKee1 and in 1938 by Seddon8 that the operation was actually harmful if performed in patients in whom the disease was still active and that the surgery conferred no demonstrable benefit upon the patients in whom the disease had healed. In spite of this information the operation was
being performed in many parts of the world by surgeons whose faith in it was so great that they refused to submit the procedure to the test of a controlled trial until mid-1980s. Thus, posterior fusion is now a wholly discredited traditional operation and is no longer an acceptable method of treatment, particularly since it does not affect progression of the disease in many instances. It is now rarely used except to reinforce an anterior spine fusion at points of greatest stress, the cervicothoracic and thoracolumbar junction. In young children, longitudinal growth was little affected by fusion, because even after solid posterior fusion the posterior elements continue interstitial growth, while the anterior column does not grow if the growth plates of the vertebral bodies are already destroyed.28,29,30

In summary, thanks to the advent of chemotherapeutics in the 1940s, the controversies on this procedure had a natural death. Nowadays, there is no need for posterior spinal fusion for active spinal tuberculosis even though some die-hards still swear by it.

Anterior surgery

Limited focal surgery (focal debridement)
This procedure was conceived together with abscess evacuation to enhance the healing of the tuberculosis under chemotherapy. Florey in 1954 stated that the exclusion of chemotherapeutic agents from established tuberculous abscess prevents their influence in such cases and it has been widely taught that chemotherapeutics cannot satisfactorily enter a spinal tuberculous lesion from the blood stream.10

Stevenson in 1959 considered chemotherapeutics ineffective when their use was not supported by operation22 and Roaf et al. in 1959 considered that in the presence of a large abscess, chemotherapy was relatively ineffective.28 At the time, sadly, the effectiveness of the controlled chemother- apy was not appreciated by many surgeons until the MRC reports of 197314 and 1976 demonstrated the incorrectness of such opinions.

Focal debridement alone is rarely indicated nowadays because evidence suggests it does not improve healing nor prevent the kyphosis from progressing. Extirpation of the infected focus is contraindicated in children as it may damage the remaining growth plates in children. Although the procedure is simple, it carries a small risk of complications such as dural tear, cord injury, and injury to nerve roots, autonomic and peripheral nerves.

Anterior radical surgery

In the late 1950s and early 1960s, the responsible opinions on the best method of treatment varied widely: it was a struggle between conservative versus surgical management of spinal tuberculosis.

The concept of radical excision of the affected vertebral bodies and of their replacement by bone-grafts was

Fig. 1 Surgical treatment of active spinal tuberculosis with mild to moderate non-rigid (flexible) kyphosis.
The procedure was not well accepted as a safe and effective procedure until 1956 when Hodgson and Stock in Hong Kong published the first account of this procedure. The Hong Kong surgeons claimed that radical surgery under the cover of chemotherapy gave excellent result in their hands and that surgery was the obvious answer.Anterior radical surgery (Hong Kong operation) was then advocated as the treatment of choice for spinal tuberculosis until mid 1970. It gradually became clear that the only advantage of anterior radical surgery was essentially deformity correction and to a certain extent prevention of deformity progression. The author’s experience suggests that because of graft failure, the procedure was not always successful in preventing kyphosis progressing and/or correcting. The procedure could not meet patients’ aesthetic demands. This drawback of the Hong Kong operation compelled some surgeons in the mid 1970s to develop a newer method to meet the patients’ aesthetic demands.13,21,24

Stabilizing spinal instrumentation surgery

Andry in 1741 suggested the use of the splintage method to treat spinal deformity.32 But approximately 180 years passed before the development of the internal spinal fixator, the Harrington rod-hook system in 1949.13 Since early 1975 in Korea I and my associates tackled the clinical problem of spinal tuberculosis with kyphosis in order to solve the patients’ and their parents’ aesthetic demands.13

Posterior instrument stabilization

As the first surgical attempt, posterior interspinous wiring and fusion method was used in children. This was followed by interspinous wiring and cementation to stabilise the involved segment and to arrest the posterior spinal element growth. Those two combined techniques failed because of the loosening of the wires and cement.

The child’s spine was then fixed with passive posterior compression using a rod and hook system. Even this procedure did not succeed. Lastly the combined posterior instrumentation and anterior radical surgery was evolved by the present author during the later part of 1981.13 Harrington rod-hook system for adults and Rush nail or Steinmann pins for children’s spines were used.14 Since 1987 Zielke and MOSS systems were used to replace the Harrington system. After 1991 the Cotrel-Dubousset (CD) system was utilised.14,34,35 In patients with early spinal tuberculosis, posterior instrumentation alone could prevent the progression of kyphosis under the cover of chemotherapy.21

Combined posterior instrumentation and anterior radical surgery

My first report in 1983 did not draw any surgeons’ attention. Rather it raised several controversies. Most were strongly against the use of metals in the infected spine. But I was confident of doing so based on the experience of Kim in Korea who had carried out THR for tuberculosis of the hip since 1973 and reported the successful outcome in 1979. The fact that metal was harmless in the tuberculosis lesion was experimentally proven by Oga in 1993 in Japan and Ha et al. in 2004 in Korea.36 This was due to the characteristic behaviour of tuberculosis bacilli. They are usually present in planktonic form, have very slow division, non-production of adhesion molecule and slime, and less bacillary population in the bony lesion.

Anterior radical surgery and anterior instrumentation

I performed this operation in a patient with a tuberculosis of L3 in 1987. Since Eysel et al.’s report in 1997 recording combined anterior radical surgery and anterior instrumentation for pyogenic spondylodiscitis, this procedure has been gradually gaining popularity. Without sound scientific basis I am very concerned about it.38 This procedure has been done endoscopically since 1998 with great success. The biocompatibility of the metal in the tuberculosis lesion was clinically proven through THR surgery.39 However, the controversy still exists among the surgeons because the use of biomaterials in the infected lesions of the pyogenic origin are strongly opposed by most surgeons.34 Pyogenic bacteria have different bacterial behaviour from tuberculous bacilli.

Deformity correction surgery

Non-instrumented posterior fusion has been attempted to stabilise the affected segment and preventing progress of the kyphosis was anticipated. However, the procedure failed during the early 20th century.1,23 Hong Kong surgeons attempted the correction of mild and moderate kyphotic deformity by anterior radical surgery from 1957 but there were limitations.9

For severe kyphosis, O’Brien et al. in 1973 used the combined pre-surgical halo-pelvic traction and subsequent additional combined deformity correction and stabilization surgery with a good outcome.40 He utilised the halo system developed by Perry and Nickel40 and the halo-femoral system developed by Kane and Moe (1969).41

For the flexible moderate degree kyphosis in an active stage, the combined two stage operation of posterior instrumentation and anterior radical surgery was introduced by Moon et al. in 1983 with a good outcome.13,21,24 This procedure is now well accepted and has been used extensively all over the world. Anterior radical surgery and anterior instrumentation has also been practised since 1987. In comparing the two methods I prefer the former method because it provides more deformity correction than the latter.

Transpedicular decancellation osteotomy and posterior closed wedge osteotomy of the spine are being practised for the healed tuberculosis kyphosis. In future I am expecting to see the segmental vertebral column shortening deformity correction osteotomy. The total en bloc spondylectomy procedure and Ilizarov’s callotasis procedure after spinal osteotomy will be introduced if the safety of the procedure is proven.
All the corrective procedures for the severe rigid kyphosis are rather challenging and dangerous with high complication rates. The patient and their families should be cautioned about the possible complications of paraplegia before opting for the procedure and informed consent should be obtained after the detailed explanation about the surgical procedure (Fig. 2).

Pott’s paraplegia

The first surgical procedure for Pott’s paraplegia was done by Menard in 1895. He decompressed an abscess surrounding the spinal cord, and was delighted to find that the patient recovered neurologically. This led him and other surgeons to decompress the spinal cord through a variety of posterolateral and anterolateral approaches. However, it was unable to survive until the advent of chemotherapy, because it could not contribute to curing the disease and more frequently worsened the clinical course.

Chemotherapy changed the outcome of the decompression surgery completely. In addition to the direct decompression surgery, it has been found recently that posterior instrumented stabilisation surgery under the cover of chemotherapy can indirectly decompress the cord and hasten the neurological recovery.

Conclusion

In the end, may I impress upon you that spinal tuberculosis is essentially a medical condition. When the disease advances and causes complications/residual sequelae, surgical intervention does have a role. To be a good surgeon, you must be a good knowledgeable chemotherapist first. The problems not yet solved in management shall be our future task and not the invention of new implants. To alleviate human suffering shall remain our priority.

I sincerely hope that the messages that I have tried to convey to you may turn into food for thought in your daily practice.

References


