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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректур авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალებების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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FUNCTIONAL AND RADIOLOGICAL OUTCOME FOLLOWING EXTENDED POSTERIOR CIRCUMFERENTIAL DECOMPRESSION IN THE TUBERCULOSIS OF DORSAL SPINE

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Abstract.

Spinal Tuberculosis ranks as one of the most common extrapulmonary varieties of tuberculosis. The study outlines the Extended Posterior Circumferential Decompression (EPCD) procedure for managing tuberculous spondylitis, a prevalent extrapulmonary form of tuberculosis. EPCD involves 360-degree dural decompression, anterior column debridement, and reconstruction following posterior instrumentation. This technique addresses both the infection and associated complications, particularly beneficial in cases with or without paraplegia. EPCD aims to improve outcomes by effectively tackling the pathology and restoring spinal stability.

Purpose: To evaluate the functional and radiological outcome following Extended Posterior Circumferential Decompression in the tuberculosis of dorsal spine.

Methods and study design: A total of 10 patients were included after fulfilling inclusion criteria between July 2019 to December 2021, all patient underwent Extended Posterior Circumferential Decompression. All patients assessed using Visual analog scale (VAS), Medical Research council (MRC) grading, Frankel grading, Kyphus angle, Erythrocyte sedimentation rate (ESR), X-rays preoperative, immediate post operative period and 9 month follow up.

Results: All patients were available for follow up, in this study mean age was 55.7 ± 17.91 . Out of 10 patients 60% were female, 40% was male. VAS, MRC grading, Frankel, ESR values, Kyphus angle showed better results in terms of functional and radiological outcome at 9 month follow up compared to pre operative values.

Conclusion: The Employed Posterior Costotransversectomy Decortication (EPCD) technique grants ample ingress to both the lateral and anterior domains of the spinal cord, ensuring an equally efficacious decompression. This approach, characterized by its diminished morbidity, steers clear of the entanglements linked with thoracotomy and laparotomy. Moreover, it fosters prompt mobilization, thereby forestalling the adversities entailed by protracted immobility. With its capability for favorable kyphosis correction, adept surgical decompression, and enhanced functional outcomes, it stands as a beacon of surgical finesse.

Key words. Dorsal spine, Tuberculous spine, EPCD.

Introduction.

Spinal tuberculosis (TB) predominantly affects the vertebral bodies, with approximately 98% of cases involving them. Thus,

anterior decompression becomes necessary when warranted. In instances of posterior complex disease and interspinous tuberculous granuloma, laminectomy is advisable. Spinal TB is among the most common type of skeletal tuberculosis, accounting for half of all cases [1,2]. Traditionally, the anterior approach has been preferred because it provides direct access to the afflicted vertebral bodies, allowing for debridement, decompression, and defect correction. However, anterior thoracic surgery (thoracotomy) poses significant morbidity risks, particularly due to infection-induced osteoporosis weakening vertebrae and complicating fixation and biomechanical stability. Associated complications contribute to higher morbidity and mortality rates, often necessitating surgical intervention, depending on severity.

Neurological complications in active spinal TB primarily stem from mechanical compression, instability, and inflammation, transitioning to intrinsic spinal cord changes in the healed stage, especially in longstanding kyphotic deformities. Treatment must integrate conservative measures with surgical decompression when warranted, based on MRI findings. Preservation of cord integrity and edema/myelitis response to conservative therapy, while extradural compression cases demand early surgical intervention.

To address the limitations of anterior approach stability, a combination anterior debridement and posterior instrumentation method is recommended. However, this entails dual surgeries, heightening morbidity risks, and is reserved for patients with significant deformities.

Surgical elimination of compressive components, such as granulation tissue, dead bone, and disc material not only improves neurological status but also enhances drug delivery and vascularity at the disease site, aiding healing and fusion [3-5].

This study introduces the Extended Posterior Circumferential Decompression (EPCD) procedure for managing tuberculous spondylitis, with or without paraplegia. EPCD encompasses 360-degree dural decompression, anterior column debridement, and post posterior instrumentation [6,7]. This technique addresses the multifaceted aspects of spinal TB management, aiming to optimize outcomes by effectively addressing infection, associated complications, and structural integrity restoration.

Materials and Methods.

This prospective study was done in the Orthopedics department of an academic hospital in Pondicherry, after the approval of ethical committee over a period of one and half years (July 2019-

December 2021). Patients diagnosed to have tuberculosis of dorsal spine with pain, deformity and neurological deficit were treated with Extended posterior circumferential Decompression assessed clinically and radiologically. All clinically and radiologically diagnosed patients with tuberculosis of dorsal spine between July 2019 to December 2021 were included in this study. The study excluded individuals having a history of previous spine surgery, medically unfit patients, and multilevel TB of the spine.

The patients who underwent Extended posterior circumferential decompression (EPCD) were evaluated immediately preoperatively and 1 year follow up. Convenient sample size of 10 patients were used in this study. However, one patient passed away 8 months after surgery due to other medical condition.

Pain, neurological status, and Kyphotic correction were assessed by using Visual analog scale (VAS), Frankel grading, medical research council (MRC) grading respectively. Data collections were obtained and entered into an excel sheet. Privacy and confidentiality were maintained throughout, ESR, X-ray Dorso-Lumbar Spine Anteroposterior/ Lateral view, MRI Dorso-Lumbar spine was recorded from all patients in the study.

Surgical Technique.

The surgical method begins with a posterior midline exposure that extends several levels above and below the lesion. Dissection begins at the lesion level and progresses bilaterally to reveal transverse processes, costotransverse articulations, and the inner 5-8 cm of ribs. Pedicle screws are located at both the proximal and distal levels, and they may be reinforced with cement for osteoporotic bone. Bilateral costotransversectomy can be used to drain prevertebral abscesses and expose afflicted vertebral bodies. Following temporary stabilization, bilateral laminectomy and corpectomy enable circumferential decompression. A temporary rod on the contralateral side provides support. A tailored rod and interbody spacer are then positioned to treat kyphosis by shortening and compressing the spinal column. This comprehensive technique attempts to address pathology, stabilize the spine, and correct abnormalities, ultimately improving patient outcomes.

Figure 1A showing exposure of dorsal spine and figure 1B showing after instrumentation before closure.



Figure 1 A

Figure 1 B

Figure 1A,B. Intra operative pictures during the procedure, 1A showing exposure of dorsal spine and 1B showing after instrumentation before closure).

Results.

Among the study population, the mean age was 55.7 ± 17.91 years with a female preponderance of 60%. Out of the 10 patients included in this study 6 patients did not have any complications, 2 of them had Deep vein thrombosis, 1 had worsening of bedsore and 1 passed away due to other medical cause 8 months after surgical intervention. The mean ESR Pre Op was 94 ± 3.03 , it was 24 ± 2.34 at post-op.

In this prospective study of 10 patients, the pre-op VAS Score was 7 in 7 patients and 8 in 3 patients. One year follow up VAS Score, was 2 in 7 patients and 1 in 2 patients. Neurological deficit assessment done using Frankel grading in preoperative period was A in 50%, 30% were B, and 20% were C. On assessment using Frankel grading in one year follow Up, 5 of them improved to D, 3 of them to E and 1 remained in C. Among the study population with MRC grading preoperatively, 50% of them were 0, 30% of them were 1 and 20% of them were 2. In one year follow up of MRC grading, 4 of them were 4, 3 patients had a score of 5 and 2 had an MRC grade of 3. The Table 1 shows the Preoperative Kyphus angle and one year follow up Kyphus angle.

Table 1. Preoperative Kyphus angle and one year follow up Kyphus angle.

Parameter	Mean \pm SD	Median	Minimum	Maximum
Kyphus Angle in Pre-operative	27.9 ± 4.12	30.00	21.00	33.00
Kyphus Angle in follow up	21.6 ± 3.89	21.50	17.00	26.00

The mean Kyphus Angle in follow up for 10 patients was 27.9 ± 4.12 , it was 21.6 ± 3.89 at one-year post-op.

The Figure 2A and 2B shows the Preoperative Xray anteroposterior view (2A) and lateral view (2B) showing D6-D7 collapse in a 57-year-old male a case of D6-7 Potts spine with neurological deficit.

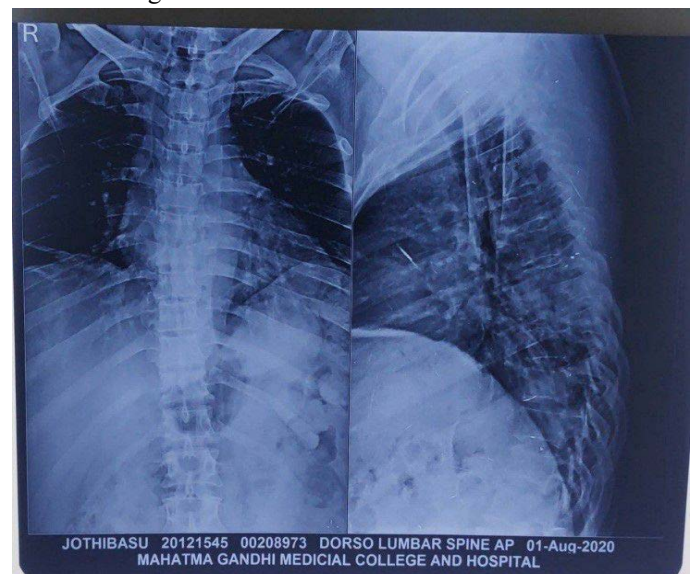


Figure 2A

Figure 2B

Figure 2A,B. Figure 2A,2B: Pre operative Xray anteroposterior view (2A) and lateral view (2B).

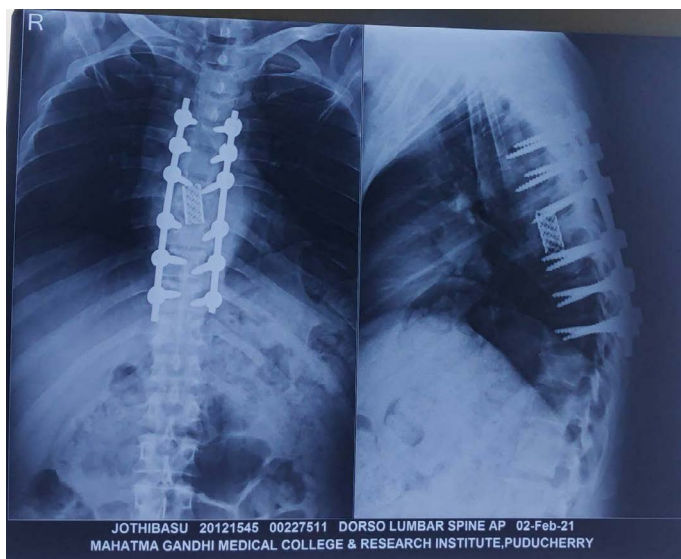


Figure 3A

Figure 3B

Figure 3A,B. Follow up Dorsolumbar spine Xray anteroposterior view (3A) and lateral view (3B).



Figure 4A

Figure 4B

Figure 4A,B. Follow clinical pictures of a 57-year-old male a case of D6-7 Potts spine with neurological deficit showing standing (4A) and flexion (4B).

The Figure 3A, 3B shows the Follow up of Dorsolumbar spine Xray anteroposterior view (3A) and lateral view (3B) showing D6-D7 collapse in a 57-year-old male a case of D6-7 Potts spine with neurological deficit.

Figure 4A,4B shows the Follow clinical pictures of a 57-year-old male a case of D6-7 Potts spine with neurological deficit showing standing (4A) and flexion (4B).

Discussion.

Spinal TB is treated using either conservative approaches or surgery. The usual method consists of chemotherapy, imaging,

and blood marker surveillance every three months, accompanied by a return to normal activities with braces. Bed rest, with or without plaster casts, is also part of the approach. It results in extended recumbency consequences such as deep vein thrombosis, pressure ulcers, and chest infections and needs protracted periods of immobilisation. It is unable to halt the kyphotic deformity's development [8,9].

Surgery is recommended in advanced instances and the elderly to avoid problems with conservative management, as well as those who did not exhibit symptoms of progressive healing, the emergence of neurological disorders, or neurological worsening during conventional therapy. The goals in treating these patients of the thoracic spine are to arrest the progression of kyphosis, maintain, strengthen stability, correction, and execute a suitable decompression and debridement [10].

The anterior approach is widely recognised as the most appropriate among decompression procedures for decompression of Pott's spine. Hodgson and Stock established radical frontal surgery in 1960. The classic anterior approach provides numerous benefits, including the ability to immediately reach the disease and perform decompression, more deformity repair, fewer muscle dissection, and the capacity to anchor a graft under compressive stress for fusion [11].

Morbidity and mortality associated with transpleural and retroperitoneal methods, such as atelectasis, pneumothorax, and postoperative ileus, as well as enhanced instability of the spine following anterior decompression are important downsides [12]. Additionally, challenges arise when patients have concurrent pulmonary pathologies. Despite these concerns, the anterior approach remains the gold standard for debridement and decompression due to its direct access to the affected area.

The use of tricortical iliac crest grafts is associated with donor site morbidity, while anterior instrumentation may not provide sufficient stability for proper fixation due to concurrent inflammation and the hyperemic, porotic nature of anterior bones. Difficulty in implant retention, as well as potential issues like graft subsidence and slippage, further complicate matters. Utilizing transpedicular screws with the Moss Miami system has been shown to effectively stabilize the thoracolumbar and lumbar spine.

Our study focused on anterior decompression and posterior stabilization using the Extended Posterior Circumferential Decompression approach, resulting in swift recovery and early mobilization. We prospectively assessed functional and radiological outcomes in 10 patients, with a male-to-female ratio of 40% to 60% and ages ranging from 22 to 72 years. Schirmer et al. [13] noted that 50% and 25% of patients develop Pott's disease in their first and second decades of life, respectively, while most patients in our study were in their second to sixth decades of life. In our study, the Pre-Operative VAS Score was, with 70% of patients scoring 7 and 30% scoring 8 and 70% of them had a score of 2 on the post-Follow-Up Vas, while 20% had a score of 1.

Garg et al. [5] conducted a retrospective analysis on 70 patients with thoracic and lumbar tuberculosis to evaluate the medical, radiological, and practical consequences of anterior versus posterior debridement and stabilization. Their findings suggested that while posterior instrumentation achieves superior

kyphosis correction and is linked with fewer complications and morbidity, the anterior approach remains an equally viable strategy for effective debridement and stabilization. Despite the advantages offered by the posterior route, both techniques exhibit comparable efficacy in addressing the pathology and restoring spinal stability, providing clinicians with valuable options in the managing spine tuberculosis. In a retrospective analysis of spinal TB, Moon et al. discovered that posterior instrumented stabilisation alone might correct and stop the progression of kyphosis [7].

In our study, there were short term complications like deep vein thrombosis (DVT) in 2 patients and worsening of bedsores in 1 patient. The 2 patients who developed DVT did not follow DVT prophylaxis as advised and the patient who had worsening of bedsores from grade 2-3 was due to poor home care provided after discharge from hospital. All the patients who followed our DVT prophylaxis and post operative care regimen as advised did not develop any short-term complications, hence it can be understood that the development of these short-term complications were individual patient parameters and not due to the surgical technique used by us. The Extended posterior circumferential approach proves safe for thoracic Pott's disease, boasting swift operation and minimal postoperative complications. It notably enhances neurological, radiological, pain, and functional outcomes, as evidenced by the study findings.

Conclusion.

The Extended Posterior Circumferential Decompression provides adequate access to the lateral and anterior portions of the spinal cord, ensuring efficient decompression with little morbidity. This approach circumvents the complications linked to thoracotomy and laparotomy, promoting early mobilization and averting issues arising from prolonged immobility. Moreover, it yields favorable outcomes including improved kyphosis correction, enhanced surgical decompression, and superior functional recovery.

REFERENCES

1. Jain AK. Tuberculosis of the skeletal system. *Indian J Orthop.* 2016;50:337.
2. Jain AK, Dhammi IK, Prashad B, et al. Simultaneous anterior decompression and posterior instrumentation of the tuberculous spine using an anterolateral extrapleural approach. *J Bone Joint Surg Br.* 2008;90:1477-81.
3. Hodgson AR, Stock FE, Fang HS, et al. Anterior spinal fusion. The operative approach and pathological findings in 412 patients with Pott's disease of the spine. *Br J Surg.* 1960;48:172-8.
4. Hee HT, Majd ME, Holt RT, et al. Better treatment of vertebral osteomyelitis using posterior stabilization and titanium mesh cages. *J Spinal Disord Tech.* 2002;15:149-56.
5. Garg B, Kandwal P, Nagaraja UB, et al. Anterior versus posterior procedure for surgical treatment of thoracolumbar tuberculosis: A retrospective analysis. *Indian J Orthop.* 2012;46:165-70.
6. Fukuta S, Miyamoto K, Masuda T, et al. Two-stage (posterior and anterior) surgical treatment using posterior spinal instrumentation for pyogenic and tuberculous spondylitis. *Spine (Phila Pa 1976).* 2003;28:E302-308.
7. Moon MS, Woo YK, Lee KS, et al. Posterior instrumentation and anterior interbody fusion for tuberculous kyphosis of dorsal and lumbar spines. *Spine (Phila Pa 1976).* 1995;20:1910-6.
8. Jutte PC, Van Loenhout-Rooyackers JH. Routine surgery in addition to chemotherapy for treating spinal tuberculosis. *Cochrane Database Syst Rev.* 2006;1:CD004532.
9. Moon MS. Tuberculosis of the spine. Controversies and a new challenge. *Spine (Phila Pa 1976).* 1997;22:1791-7.
10. Rasouli MR, Mirkoohi M, Vaccaro AR, et al. Spinal tuberculosis: diagnosis and management. *Asian Spine J.* 2012;6:294-308.
11. Son ES, Lee SH, Park SY, et al. Surgical Treatment of T1-2 Disc Herniation with T1 Radiculopathy: A Case Report with Review of Literature. *Asian Spine J.* 2012;6:199-202.
12. Thammaroj J, Kitkuandee A, Sawanyawisuth K. Differences of MRI features between tuberculous and bacterial spondylitis in a tb-endemic area. *Southeast Asian J Trop Med Public Health.* 2015;46:71-9.
13. Schirmer P, Renault CA, Holodniy M. Is spinal tuberculosis contagious? *Int J Infect Dis.* 2010;14:e659-666.