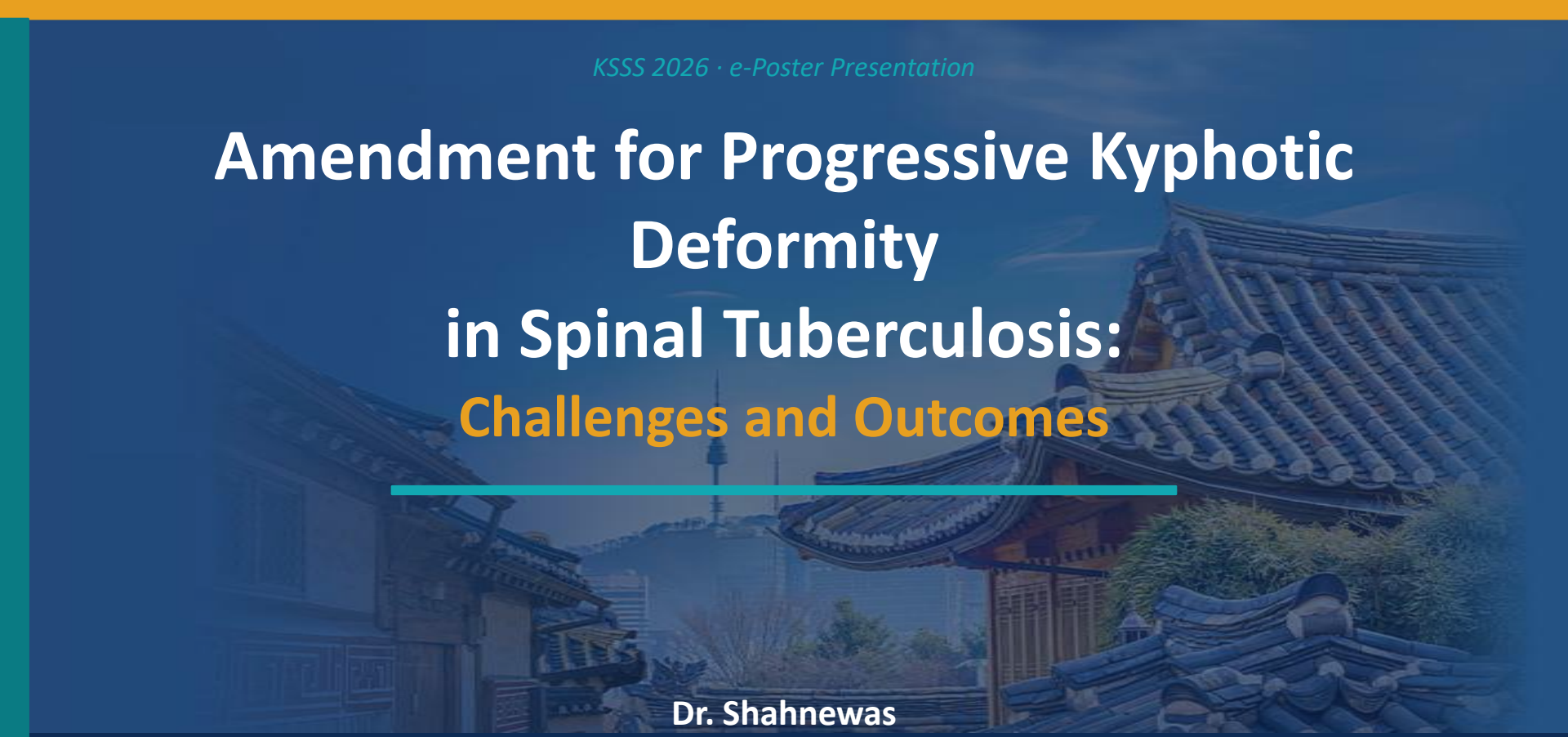
KSSS 2026 · e-Poster Presentation

Amendment for Progressive Kyphotic Deformity in Spinal Tuberculosis:

Challenges and Outcomes



Dr. Shahnewas
Assistant Professor
(Bangladesh)

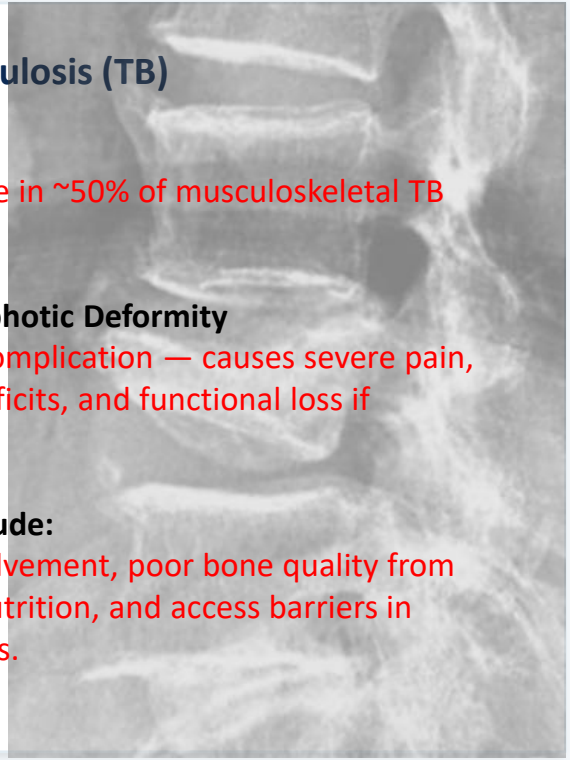
Introduction & Background

Spinal Tuberculosis (TB)

Pott's disease
affects the spine in ~50% of musculoskeletal TB cases.

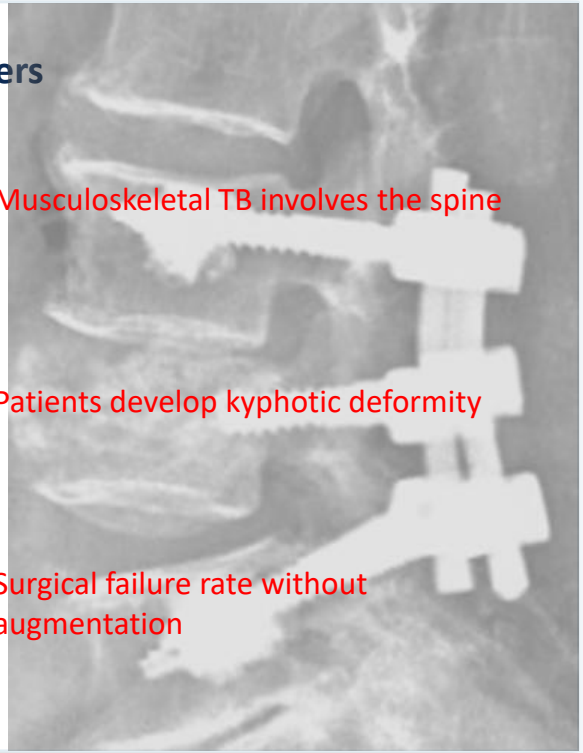
Progressive Kyphotic Deformity
— a hallmark complication — causes severe pain, neurological deficits, and functional loss if untreated.

Challenges include:
multi-level involvement, poor bone quality from infection/malnutrition, and access barriers in endemic regions.



Why This Matters

50%	Musculoskeletal TB involves the spine
30–50%	Patients develop kyphotic deformity
High	Surgical failure rate without augmentation



Study Objectives

01 Evaluate Surgical Strategies

Assess different surgical approaches for correction of kyphotic deformity in spinal tuberculosis.

02 Analyze Clinical Outcomes

Measure pain relief and functional recovery using VAS and Oswestry Disability Index (ODI) scores.

03 Assess Radiological Results

Evaluate vertebral height restoration and screw pullout resistance post-operatively.

04 Identify Challenges & Solutions

Document surgical pitfalls, failure modes, and augmentation strategies for long-term construct stability.

Materials & Methods

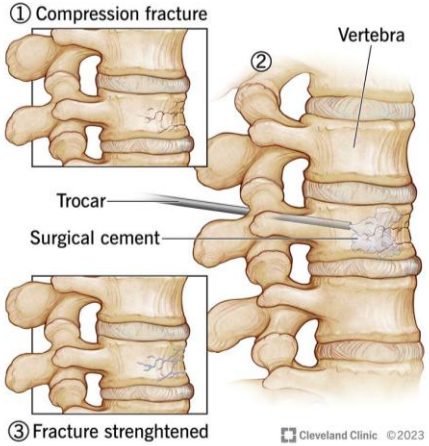
Study Design	Sample Size	Location
Prospective Interventional Study	17 patients (10F, 7M)	Bangladesh Spine & Orthopedic Hospital

Period	Assessment	Follow-up
Jan 2024 – July 2025	VAS & Oswestry Disability Index	Min. 1 year follow-up

Surgical Options & Strategy

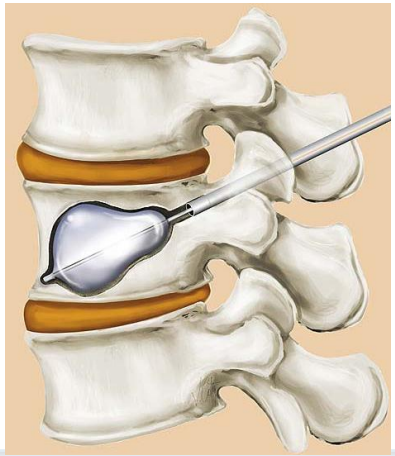
01 Vertebroplasty

- Cement injection into fractured vertebra
- Restores height, reduces pain
- Minimal invasive approach
- Best for stable compression fractures



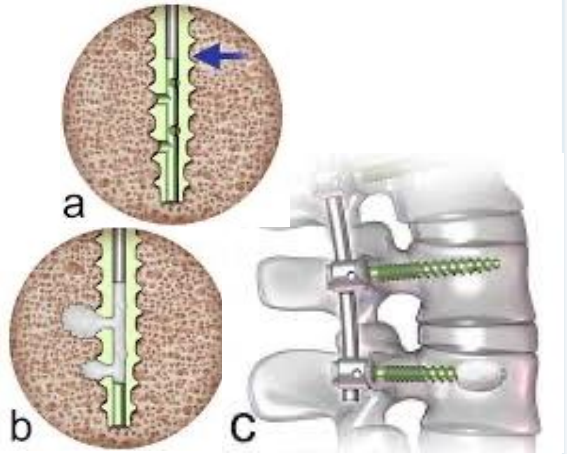
02 Balloon Kyphoplasty

- Balloon inflated to create cavity
- Cement fills void under low pressure
- Better height restoration vs vertebroplasty
- Reduces cement leak risk



03 Cement-Augmented Pedicle Screw Fixation

- Gold standard for unstable fractures
- Fenestrated screws allow cement delivery
- Significantly ↑ pullout strength
- Reduces screw loosening & failure



Surgical Pearls

1

Cement Augmented Fixation
Use fenestrated pedicle screws with controlled low-pressure cement injection to maximize pullout strength without cement extravasation.

2

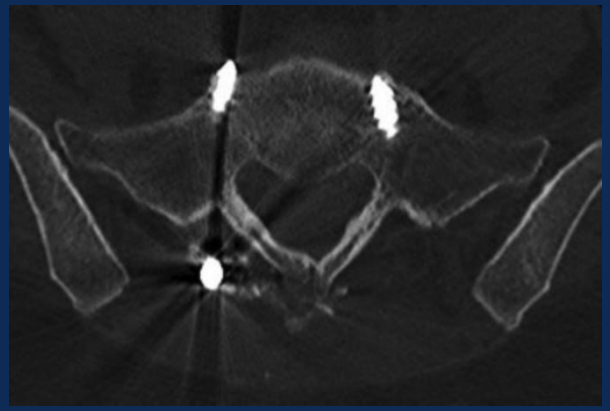
Expandable Screws
Deploy expandable pedicle screws in severely osteoporotic bone to achieve biological anchorage when standard screws are insufficient.

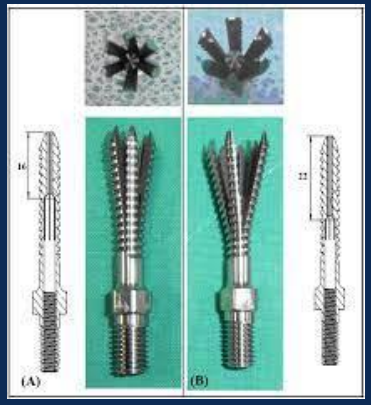
3

Long Segment Fixation
Extend construct beyond the diseased segment (2-3 levels above and below) to distribute load and reduce failure risk at adjacent levels.

4

Biocritical Purchase
Combine mechanical fixation with anti-resorptive and anabolic therapies to optimize bone quality and biological integration of implants.





Results: Clinical Outcomes

17
Patients
10F · 7M

↓VAS
Score
Significant pain relief

↓ODI
Score
Improved disability index

1 yr+
Follow-up
Min. follow-up duration

Outcome Measure	Pre-operative	Post-operative	Improvement
VAS Pain Score	7.8 ± 1.2	2.1 ± 0.9	**Significant ✓**
ODI Disability Index	68.4 ± 8.3	22.7 ± 6.1	**Significant ✓**
Vertebral Height	Compromised	Restored	**Maintained ✓**
Screw Pullout	High Risk	Augmented	**Reduced ✓**

Discussion

? Key Challenges

- High surgical failure rate in osteoporotic bone
- Multi-level spinal involvement in TB
- Cement leakage risk during augmentation
- Delayed diagnosis leading to severe deformity
- Limited access to advanced implants in endemic regions

✓ Surgical Solutions

- Cement-augmented pedicle screw fixation
- Expandable screws for severe osteoporosis
- Long-segment construct for load distribution
- Combined anti-resorptive + anabolic therapy
- Early surgical intervention to prevent progression

Conclusion

Cement-augmented pedicle screw fixation significantly increases pullout strength and construct rigidity in progressive kyphotic deformity secondary to spinal tuberculosis — enhancing stability, reducing screw loosening, improving pain relief, and accelerating functional recovery.

- Surgical augmentation is essential — conservative management alone has high failure rates in TB-related kyphosis.
- Multi-modal approach combining surgery with anti-resorptive and anabolic therapies yields best outcomes.
- Long-segment fixation with cement augmentation reduces construct failure and reoperation rates.
- Early surgical correction prevents neurological deterioration and improves quality of life.

Thank You

Dr. Shahnewas
Assistant Professor (Bangladesh)

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Key References

1. Ha KY et al. Surgical strategies for osteoporotic vertebral compression fractures. Spine J. 2016.

2. Moon MS et al. Pott's disease: current status. Int Orthop. 2012.

3. Rajasekaran S et al. Kyphotic deformity in spinal tuberculosis — surgical correction. Spine. 2013.

4. Frankel BM et al. Segmental polymethylmethacrylate-augmented pedicle screw fixation. J Neurosurg Spine. 2007.