Patna Journal of Medicine
An official journal of *Indian Medical Association, Bihar State Branch*
www.thepjm.in

CASE REPORT

Salvage of Exposed Spinal Hardware with a Pedicled Latissimus Dorsi Muscle Flap after Kyphosis Correction in a Healed Post-Tubercular Pediatric Spine

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ABSTRACT

Background: Spinal instrumentation in children with post-tubercular kyphosis carries a heightened risk of wound-healing problems because of scarred, avascular tissue. Once hardware becomes exposed, timely vascularized soft-tissue coverage is essential to avoid implant removal.

Case Presentation: A 15-year-old boy with a healed history of spinal tuberculosis underwent vertebral column realignment and kyphosis correction using a PITKAR® implant system. On postoperative day (POD) 15, he developed midline wound dehiscence with purulent discharge and exposed hardware. Pre-referral CT demonstrated a rigid 68–70° angular kyphosis centered at D12–L1 without active infection. After radical debridement, an ipsilateral pedicled latissimus dorsi (LD) muscle flap, detached 5 cm proximal to its iliac-crest origin to gain reach, was rotated across the midline to blanket the implant; the residual raw surface was resurfaced with a split-thickness skin graft (SSG). The flap remained viable, cultures were sterilized, and the patient resumed rehabilitation without further wound complications.

Conclusion: Early plastic-surgical intervention with a pedicled LD flap offers reliable, single-stage salvage of exposed spinal instrumentation in complex pediatric spines, preserving deformity correction and avoiding the morbidity of implant removal.

Keywords: Spinal tuberculosis, Pediatric kyphosis, Implant exposure, Latissimus dorsi flap, Wound dehiscence.

Patna Journal of Medicine; Volume 98, Issue 3 (2024)

INTRODUCTION

Musculoskeletal tuberculosis remains prevalent in low- and middle-income countries and continues to be a leading cause of angular kyphosis in children. Even after microbiological cure, destruction of anterior vertebral bodies often results in a rigid gibbus that necessitates osteotomy and instrumented correction during adolescence. Reported wound complication rates after complex spinal instrumentation range from 3% to 10%, with implant exposure in 2–5% of cases; in pediatric post-tubercular deformity surgery, this figure may reach 12–15% due to poor local vascularity and multiple prior operations.1-4 Muscle flaps provide superior vascularity, infection resistance, and dead-space obliteration compared with skin-only solutions.[5,6] We present the successful salvage of an exposed PITKAR implant using a pedicled latissimus dorsi muscle flap in a 15-year-old boy, underscoring the value of early plastic surgical referral.

CASE HISTORY

A 15-year-old male contracted thoracolumbar spinal tuberculosis at age 2, completed a full WHO category-I regimen, and remained disease-free thereafter. Progressively worsening deformity prompted referral to AIIMS-Patna, where he underwent posterior column

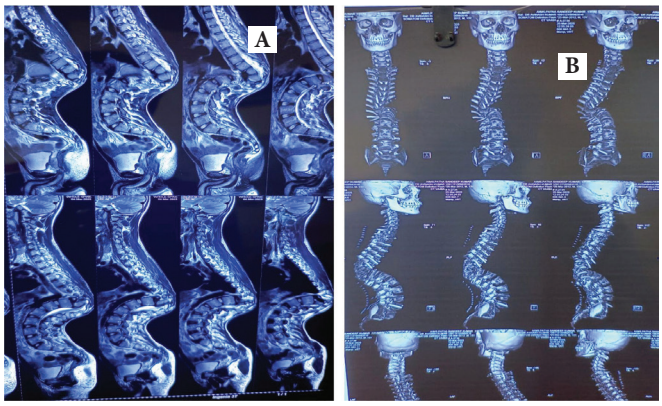

Figure 1 (A & B): Sagittal CT multiplanar reformats (Figure A) revealed a 68–70° angular kyphosis with apex at D12–L1, fused margins and no epidural abscess. Three-dimensional reconstruction (Figure B) confirmed a rigid, focal gibbus with preserved canal calibre and compensatory lumbar lordosis.

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How to cite: Mahato AK, Haq A, Singh VK, Kuldeep, Anupama. Salvage of Exposed Spinal Hardware with a Pedicled Latissimus Dorsi Muscle Flap after Kyphosis Correction in a Healed Post-Tubercular Pediatric Spine. Patna Journal or Medicine. 2024;98(3):110-112

osteotomy and kyphosis correction with the PITKAR vertebral reconstruction system.

Wound healing was unremarkable until POD 15, when sudden dehiscence, purulent discharge, and rod exposure occurred. Laboratory evaluation showed leukocytosis (13 × 10^9/L). Broad-spectrum antibiotics were started, and a plastic-surgery consult was obtained within 24 h.

Operative management

Under general anaesthesia, the midline wound (≈ 7 × 5 cm) was sharply debrided to healthy bleeding tissue; hardware was stable. A pedicled ipsilateral LD muscle flap was harvested through the same posterior incision, its tendon origin divided 5 cm proximal to the posterior-superior iliac spine to increase the arc of rotation. The flap was tunnelled medially, draped over the exposed rods, and anchored with interrupted 2-0 polyglactin sutures to the deep dermis crossing the midline for tension-free inset. The elevated skin was re-draped; the residual 4 × 3 cm raw area was resurfaced with meshed SSG from the thigh. Two closed-suction drains were placed, a tie-over bolster secured the graft, and non-compressive dressings protected the flap. Estimated blood loss was 150 mL. Intravenous cefuroxime and metronidazole were given for 7 days. The flap remained completely viable; the SSG demonstrated 80 % take at first look on POD 5. Drains were removed on POD 6 (output < 10 mL). At 6-week follow-up, the wound was fully healed, spinal alignment was maintained, and the patient resumed spinal extension physiotherapy.

Figure 2: (A) Pre op photograph showing the exposed implant on the right side. (B) corrected spinal deformity after implant placement

DISCUSSION

Incidence and risk factors

Implant exposure after spine surgery is uncommon but clinically significant, occurring in 2–5% of complex instrumentation procedures; rates rise to 12–15% in post-tubercular deformity corrections due to scarring, devascularized paraspinal muscles, and prolonged operative times.1-4 Rationale for early plastic-surgical referral. Prompt involvement of reconstructive surgeons reduces the time between

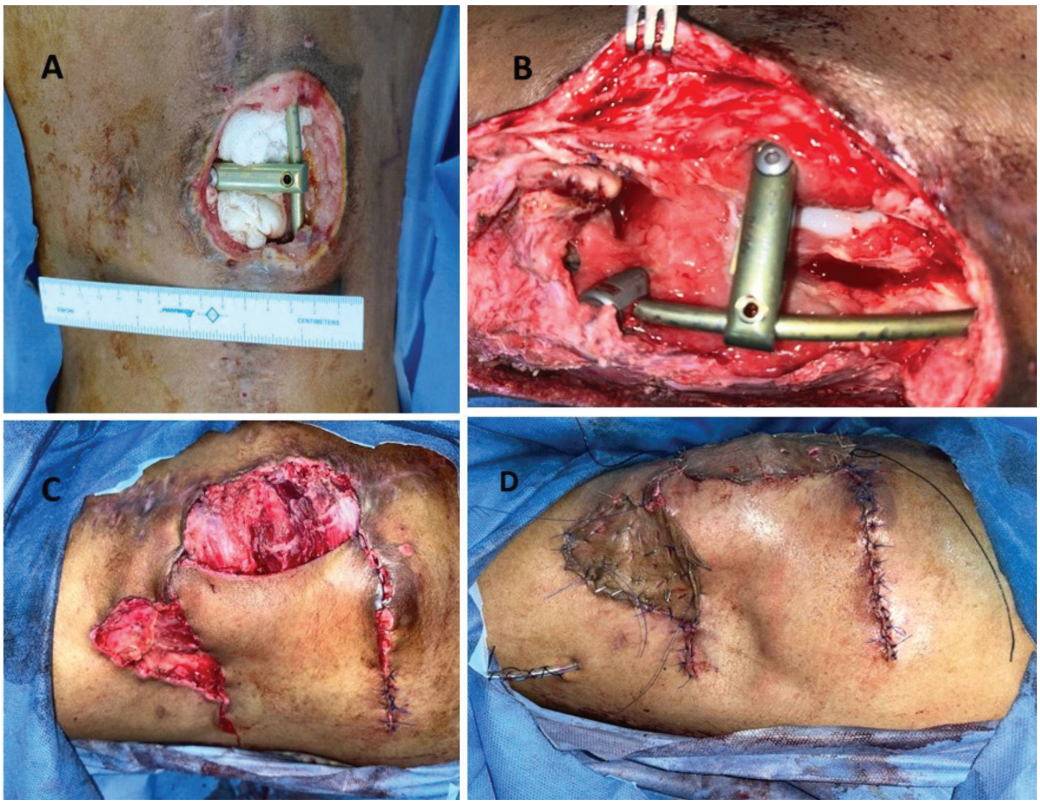

Figure 3:(A, B,C & D)
A- Defect Of Size-7x5cm, B- Post Debridement Cavity With Exposed Implant,
C- LD Flap Harvested And Inset To Opposite Side Dermis, D- Final Image After Flap Inset And Skin Cover

exposure and definitive coverage, limiting biofilm formation and avoiding hardware extraction. Muscle flaps provide robust perfusion that enhances local antibiotic delivery, improves oxygen tension, and fills dead space, all critical factors for infection control.[5-7]

Choice of flap

The LD muscle, supplied by the thoracodorsal system, offers generous bulk and pedicle length, can be harvested in the same position, and reaches defects from the upper thoracic to lower lumbar spine without microvascular anastomosis. Alternative regional flaps (trapezius, paraspinous) may be insufficient for extensive defects, and free flaps increase operative time and donor-site morbidity in pediatric patients.

In 41 spinal wounds, Nahabedian et al. salvaged infected hardware in 95% using muscle flaps, with LD accounting for 61% of cases.6 Our result corroborates these outcomes, providing complete closure and infection eradication in a single stage.

CONCLUSION

Early debridement and coverage with a pedicled latissimus dorsi muscle flap offer a reliable, single-stage solution for exposed spinal implants in children with complex post-tubercular deformities. Multidisciplinary protocols that trigger immediate plastic-surgical referral when wound compromise is detected are pivotal for preserving spinal instrumentation, and functional correction.

REFERENCES

1. Pull ter Gunne AF, Cohen DB. Incidence, prevalence, and analysis of risk factors for surgical site infection following adult spinal surgery. Spine. 2009;34(13):1422-1428.
2. Glassman SD, et al. Risk factors and treatment for surgical site infection following posterior spine surgery. Spine J. 2007;7(5):365-371.
3. Rajasekaran S, et al. Surgical correction of post-tubercular kyphosis in children: a 15-year follow-up study. J Bone Joint Surg Br. 2010;92-B:1540-1547.
4. Jain AK, et al. Tuberculosis of the spine: a fresh look at an old disease. J Bone Joint Surg Br. 2010;92-B:905-913.
5. Chang DW. Salvage of exposed spinal hardware with muscle flaps. Plast Reconstr Surg. 2002;109(6):2231-2237.
6. Nahabedian MY, et al. The role of muscle flaps in the management of infected spinal wounds. Spine. 1997;22(10):1130-1135.
7. Sbitany H, Serletti JM. Outcomes of latissimus dorsi flap reconstruction of complex posterior trunk wounds. Plast Reconstr Surg. 2011;127(1):253-262.