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Meeting orthopaedic surgical needs in tribal Madhya Pradesh: the role of Christian mission hospitals in providing advanced surgical care in low-resource settings

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Abstract

Background: Tribal regions of Madhya Pradesh, India, face significant gaps in orthopedic care, with conditions requiring surgical intervention including trauma, infections, and degenerative conditions of the musculoskeletal system. Lack of specialist care poses a major challenge in these resource-deficit areas.

Methods: A retrospective audit of orthopaedic surgeries done by the author at Padhar Hospital, a Christian mission hospital serving a predominantly tribal population, was conducted for November 2023. Data included demographics, diagnosis, fracture classifications, surgical interventions, and surgeon role, analyzed in the context of available resources.

Results: In one month audit the spectrum of orthopedic pathology and intervention was broad mainly in the male population accounting for 76% of all cases, while females comprised 24%. 92% of procedures were performed (rather than assisted). The most frequent types of procedures were closed reduction with fixation (24% of all cases), typically used for fractures and dislocations, debridement (16%), open reduction with plating (16%) for more complex fractures. Arthroplasty/joint replacements comprised 12% of cases and exploration/excision for chronic wounds or foreign body removal, arthrodesis for joint stabilization, and tendoachilles tenotomy for congenital deformity correction. Techniques were adapted for limited resources and implant availability.

Conclusion: Christian mission hospitals like Padhar Hospital provide advanced orthopedic surgical expertise in low-resource tribal areas, bridging critical care gaps. Their holistic, faith-driven service promotes physical healing and community trust, aligning with global health goals and biblical compassion. Sustained partnerships are needed to maintain and expand this capacity.

Keywords: Tribal health, rural orthopedics, mission hospitals, low-resource surgery, trauma care, Madhya Pradesh

Introduction

The tribal belt of Madhya Pradesh, India, remains a medically underserved region with limited access to specialized care.[1] Musculoskeletal needs are dominated by occupational and fall-related fractures, untreated injuries progressing to chronic infection, degenerative joint disease, and congenital anomalies.[2]

Lack of adequate infrastructure, low socioeconomic conditions, and under-resourced health systems compound morbidity.[3]

Faith-based mission hospitals have historically filled these critical care gaps.[4] Padhar Hospital, founded as a mission institution, serves as a secondary-level referral center for a large tribal catchment area, fully integrating clinical expertise with Christian compassion to address orthopedic needs.[5]

This study describes the hospital's orthopedic surgical experience during one month, illustrating both the spectrum of needs and the advanced care delivered despite constraints.

Methods

Setting: Padhar Hospital is a secondary-level, Christian mission facility serving Betul District and surrounding tribal regions of Madhya Pradesh.

Design: Retrospective service audit.

Period: 4–30 November 2023.

Data Collection: Orthopedic surgery logbook entries were reviewed. Variables were: age, sex, diagnosis, AO/OTA fracture classification (when available), procedure, and surgical role. Cases were categorized as trauma, infection/soft tissue, joint reconstruction, or pediatric/congenital conditions.

Results

From November 4 to November 30, 2023, a total of 25 orthopedic cases were recorded at Padhar Hospital. As one can see in Table 1, the patient group had a median age of 40 years, ranging from infants to elderly patients. Males accounted for 76% of all cases, while females comprised 24%. Surgical care delivery was robust with 92% of procedures performed by in-house surgeons. The spectrum of orthopedic pathology and intervention was broad. The most frequent type of procedure was closed reduction with fixation (24% of all cases), typically used for fractures and dislocations. This was followed by debridement (16%), often for infections or wound management, and open reduction with plating (16%), performed for more complex fractures. Arthroplasty/joint replacements were performed in 12% of cases. Other interventions included exploration/excision for chronic wounds or foreign body removal, arthrodesis for joint stabilization, and tendoachilles tenotomy for congenital deformity correction.

The caseload included, Table 2:

- Acute traumatic injuries (fractures, dislocations)
- Chronic infections (osteomyelitis, chronic sinus)
- Congenital and pediatric conditions (syndactyly, clubfoot)
- Tumors (giant cell tumor)
- Degenerative diseases (osteoarthritis)
- Post-operative or wound complications (hematoma, surgical site infection)

This diversity of case presentations demonstrates the hospital's need for advance surgical care for both emergency and other orthopedic presentations in a resource-limited, tribal setting.

Table 1. Key Demographics

Total cases	25
Median age (years)	40
Male (%)	76.0
Female (%)	24.0
Cases performed (%)	92.0

Table 2. Orthopedic Procedure: Distribution

Procedures	**Number of Cases**
Closed reduction + fixation of fracture	6
Debridement	4
Open reduction + Internal fixation	4
Arthroplasty	3
Excision/Exploration	3
Other (including Bone tumors)	3
Arthrodesis	1
Tendoachilles tenotomy	1

These findings showcase Padhar Hospital's vital role in meeting the orthopedic surgical needs of the tribal population with a commitment to both breadth of care and surgical leadership in challenging settings.

Discussion

The surgical case profile reflects the high trauma burden typical of rural India, alongside infectious sequelae arising from delayed care.[6,7] Advanced orthopedic procedures—notably hip arthroplasty, periarticular fracture fixation, and local muscle flap coverage—were performed in a low-resource, secondary-level environment.

Role of Christian Mission Hospitals

Christian missionary activity in India began with the arrival of Jesuit missions in the 16th century and centered on both evangelism and service, notably healthcare and education.[13] By the 19th century, Protestant mission societies such as the London Missionary Society and Church Missionary Society established hospitals and schools in underserved regions.[14] These institutions became lifelines for marginalized communities, providing critical access to healthcare where state services were limited.[4] Notable mission hospitals, including those founded in Neyyoor and central India, introduced Western medicine, formalized nursing, vaccination programs, and specialized care—laying the foundation for modern healthcare in many regions.[4,14]

Currently, mission hospitals in India face significant challenges including chronic underfunding, increased operational costs, competition from for-profit healthcare, and declines in international support. The persistent expectation of free care, aging infrastructure, and shortages of trained human resources exacerbate these pressures.[15] Despite these obstacles, mission hospitals remain unique in their sustained commitment to serving remote and marginalized populations, blending medical care with dignity and compassion.

Mission hospitals can provide unique value in such contexts.[8,9] They have been shown:

- To be the only accessible surgical referral points for large rural catchments.
- To be capable of advanced orthopedic procedures without tertiary-level infrastructure.
- To be able to train local teams in versatile surgical skills.
- To be able to create long-term trust networks with communities.

This case study supports these findings from the literature.

Theological Reflection

The mission hospital model reflects the biblical mandate to serve "the least of these" (Matthew 25:40) by integrating physical care with compassion and dignity. Healing ministries in this setting demonstrate how clinical excellence and faith-driven service can coexist to restore not only health but hope.[10,11]

Global Health Relevance

Research has shown that Faith-based hospitals deliver a significant share of healthcare in low- and middle-income countries.[4,8,9] Strengthening them aligns with WHO's universal health coverage goals and the Lancet Commission's call for equitable surgical access.[12] Hospitals such as Padhar need to be supported to continue to provide such care in the gaps and at the margins.

Conclusion

Orthopedic needs in tribal Madhya Pradesh are complex and resource-intensive. Christian mission hospitals like Padhar Hospital meet these challenges by combining advanced surgical skills with community-focused, faith-rooted care. Expanding support for such institutions is essential for improving musculoskeletal health equity in similar global contexts.

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