

Demographic Profile and Characteristics of Hand Surgery Patients in the Tertiary Care Center.

Piyush Giri¹, Shrinkhala Pokhrel¹, Pratishtha Pandey¹, Sushma Kunwar¹, Karuna Khadka¹, David Shrestha¹, Devendra Shrestha¹, Narendra Vikram Gurung¹, Bharat Bahadur Khatri².

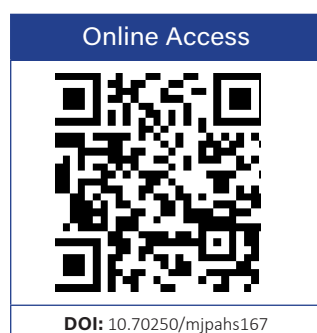
¹ Department of Surgery, Pokhara Academy of Health Sciences, Pokhara, Nepal.

² Department of Orthopedics, Pokhara Academy of Health Sciences, Pokhara, Nepal.

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Corresponding Author:

Piyush Giri

Department of Surgery, Pokhara Academy of Health Sciences, Hospital Chowk, Pokhara 10, Gandaki province, Nepal.

Email: dr.piyushgiri@gmail.com

Introduction

The hand plays a pivotal role in executing most physical activities, and its capacity for complex operations has bestowed upon us both functional and evolutionary advantages. Among plastic surgery cases, hand injuries rank as the most commonly encountered form of accidental trauma. Reported incidence rates vary widely, ranging from 57.4 to 700 per 100,000 individuals, comprising up to 4.19% of all emergency visits in Nepal.^{1,2} The spectrum of hand injuries spans from minor lacerations to wounds with soft tissue defects and total amputations. Hand surgery is still in infancy and only few study has been done on spectrum of hand injuries and its treatment in our country.³ Due lack of data collection and publications of

Abstract

Introduction: The hand's functional and characteristic uses permit it to perform various tasks, while also making it prone to injury. Hand injury is one of the most common encounters at the emergency department, most being attributed to occupational use. While most occupational trauma is accidental, it may also be subject to infections and overuse injuries. Severity in both may range from minor laceration or inflammation to finger or limb amputation. Prompt infection control and injury management are the key to adequate recovery and regain of movement. Due lack of data collection and publications of hand injury pattern in Nepal, very less is known about hand injury parttern and treatment in our country. Our study aimed to study the prevalence and etiologies of of hand surgery cases at a tertiary care center.

Methods: A retrospective descriptive cross-sectional study of patients who presented with a hand injury at a tertiary care center was done for 15 months from 1st August 2022 to 30th November 2023. After obtaining ethical approval, data like demographics, mode of injury, and course of treatment. Descriptive analysis was done where frequency and percentage were calculated.

Results: Total 68 cases of hand injuries presented at our center during the period, surgery comprising 2% of the total surgeries performed at our department. The most common presentation was acute hand injury with 60%of patients affected with soft tissue involvement (92.7%) in young male (67.6%) patients with a mean age of 35.4 years.

Conclusion: Trauma is the most frequent cause of hand injury. Hand Injuries occurred mostly in young males which is a productive population. As most of the hand injuries occurred during work-related activities in the productive age group, it is essential to examine safety measures at the workplace.

Keywords: Hand infection: epidemiology; Hand surgery; Hand trauma center; Plastic surgery; Trauma registry; Trauma surgery.

hand injury pattern in Nepal, very less is known about hand injury pattern and treatment in our country. Our study aims to investigate the prevalence and etiologies of hand surgery cases at a tertiary care center.

Methods

This retrospective descriptive cross-sectional study was conducted from August 2022 to November 2023, spanning 15 months, on patients who presented with hand injuries, following ethical approval from the Institutional Review Committee. Clinical records of patients treated in the Department of Surgery at Western Regional Hospital were reviewed. The study included all patients who presented with hand injuries

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necessitating specialized hand surgery, while those referred to a different center or who refused treatment were excluded. Patient demographics, injury mechanisms, and wound characteristics were summarized using descriptive statistics. Continuous variables were expressed as mean and median, while categorical variables were presented as percentages. Data were tabulated in an Excel sheet and analyzed using Microsoft Office Excel version 2404.

Results

Our data comprised 68 cases encountered within the study period. The mean age of patients was 35.4 years, with a range of 1.5 to 75 years. The age group of 21-40 years constituted the majority (34%), followed by age groups of 1-20 years and 41-60 years [Table 1]. Males were more commonly affected 46 participants (68%) and 22 (32%) female participants. There was a seasonal variation in patient presentations. The winter months, November to January, accounted for the busiest period of the year for the department with 39 cases (57.3%), while the summer months, between May and July, were the least damaging with only 4 cases (5.9%) (Table 2).

Table 1: Age distribution of the cases encountered

Age Group (years)	Number (N)	Percentage
0-20	19	27.9
21-40	23	34
41-60	19	27.9
61-80	7	10.2

Table 2: Seasonal distribution of total hand surgery cases

Season	Number (N)	Percentage (%)
Spring	17	25
Summer	4	5.8
Autumn	8	11.8
Winter	39	57.3%

Fifteen cases were attributed to infection (22%), while 53 cases were non-infectious (78%). Of the hand infections, four were acute (27%) and 11 were chronic (73%). Deep infections (40%) were the most common presentation, with other types of infection detailed in Table 3.

Table 3: Types of hand infections encountered at our center

Types of infections	Number (N)	Percentage (%)
Deep infection	6	40
Tenosynovitis	4	26.6
Osteomyelitis	3	20
Non-healing ulcer	1	6.7
Necrotizing fasciitis	1	6.7

Out of the 53 of hand injuries, 41 were acute trauma cases (77.3%), and 12 cases were non-traumatic (22.7%). Occupational trauma was the most common mode of injury in 30 participants of traumatic hand injuries (73%) vs non occupational hand injury in 11(27%) cases. There were 18 cases of sharp injuries (43.9%), followed by 16 cases of crush injury (39%), and 7 cases

of blunt injury (17.1%). Among them, soft tissue involvement requiring reconstruction was seen in 38 cases (92.7%), followed by 35 cases with tendon involvement (85.3%) [Table 4]. The involved structures were repaired at our center.

Table 4: Structures involved and repaired in traumatic hand injuries

Structures involved and repaired in traumatic hand injuries	Number (N)	Percentage (%)
Soft tissue	38	92.7
Tendon	24	58.5
Nerve	12	29.2
Bone	10	24.3
Blood vessel	9	21.9

Other hand surgery cases included five cases of ganglion cyst (41.7%), two cases of corn (16.7%), one case of congenital hand deformity (syndactyly), and one post-burn contracture, as shown in Table 5. The mean duration of hospital stay was 7 days, ranging from 1 to 27 days.

Table 5: Miscellaneous hand surgery cases

Etiologies of non-infectious chronic hand injuries	Number (N)	Percentage (%)
Ganglion cyst	5	41.7
Corn	2	16.7
Post-burn contracture	1	7.1
Stiff finger	1	7.1
Spindle cell neoplasm	1	7.1
Lipoma	1	7.1
Verrucous ulcer	1	7.1

Finally, a total of 3008 surgeries were performed at our department during the period, which accounted for 66 hand injuries (2%).

Discussion

Hand and wrist injuries contribute significantly to emergency department visits worldwide, accounting for around 6.6% to 28.6.¹ In Nepal, they represent 2% to 10% of emergency visits. In our study, major hand surgery cases constituted 2.1% of total surgeries in the surgery department. The actual incidence might be higher due to underreporting, especially for minor hand/wrist injuries, particularly in cases of polytrauma and multiple trauma in emergency settings.³⁻⁵

We found that the age groups most requiring specialized hand surgery expertise were between 15 to 60 years, consistent with studies in eastern Nepal and various tertiary care centers in Nepal.^{5,6} Our mean age of 35.4 years aligns with a study from Bangladesh.⁷ This economically productive age group is particularly vulnerable to machinery and field equipment injuries, echoing patterns observed in several studies. Given that this demographic constitutes a significant portion of the labor force, mainly comprising daily wage workers, injuries in this group pose substantial economic burdens on the nation, as rehabilitation often entails prolonged absences from work.⁴

Males dominated our cases, with 73% affected, a ratio consistent with findings from a study by Karki et al.⁸ This correlates with the predominance of males in industrial and field-related occupations, as indicated by similar studies on the demographic profile of hand surgery cases in Nepal.^{3,8,9} Unlike studies from developed nations like Norway, Israel, and Germany, where leisure activities are the most common cause of hand injuries, in our context, occupational hazards play a significant role.¹⁰⁻¹² Globally, hand injury trends have modestly decreased since the 1990s, but in low and middle-income countries, they have increased by 25%, underscoring the lack of priority given to occupational safety and health, particularly in least-developed countries like Nepal, where work-related accidents claim approximately 200 lives annually, indicating a pressing need for improved occupational safety measures.^{9,13}

Sharp cuts were the most common mechanism of injury in our study, mirroring findings by Sorock et al. The lack of standardized protocols, minimal safety gear, and inadequate training in factories and agriculture fields contribute to increased susceptibility to trauma, as noted by Bhattarai et al.^{9,14} Structures requiring reconstruction were similar to reports by Samal et al. and Thapa et al. Hand injuries vary in type and severity, from skin lacerations to amputations, with severe cases causing significant functional impairment. Hand injury severity scoring can aid in grading severity, with the most severe cases often leading to prolonged absence from work.^{3,15}

Hand infections are common occurrences, as seen in studies by Turker et al., with deep infection of the hand being the most common condition requiring treatment by hand surgery specialists. These infections primarily affect older age groups with comorbid conditions, necessitating extended treatment durations.¹⁶

Ganglion cysts were the most common hand tumors, consistent with findings by Karki et al. and Ingari. Ganglion cysts are benign growths with a high prevalence across various ages, with both general and occupational activities posing risk factors. Our study findings align with regard to age and distribution.¹⁷

The average hospital stay of admitted patients was 7 days, comparable to Turker et al.'s findings, which reported a mean length of stay of 6 days. The duration in our study, especially for traumatic hand injuries and hand infections, was higher than observed in most other studies, likely due to our inclusion of patients with hand infections who required longer-term care and the biweekly surgical schedule at our surgery department, prolonging waiting times for reconstructive surgery and thereby increasing hospital stays. Limitations of our study are, short duration of study, small sample size and single center study.

Conclusions

Trauma stands as the leading cause of hand injury, predominantly affecting young males, who represent a productive population. Given that the majority of hand injuries occur during work-related activities within this productive age group, it is imperative to scrutinize safety measures in the workplace to prevent such injuries.

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