



A DESCRIPTIVE STUDY OF SPECTRUM OF HAND INJURIES AND THEIR FUNCTIONAL OUTCOME PRESENTING TO A TERTIARY CARE CENTRE

Orthopaedics

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ABSTRACT

Background: Hand is one of the vital parts of human body by virtue of its unique anatomy and function. Injuries to hand even after appropriate treatment can cause permanent impairment of its functions. In modern era, hand injuries contribute a major amount of disability in the society. Previous studies have shown that 10% of all trauma cases coming to a tertiary care centre are hand injuries, with wide variety of presentations requiring proper management for timely diagnosis and treatment. Therefore, aim of this study is to evaluate the spectrum of hand injuries; their mechanism of injuries, presentations, managements and social impact.

Methods: 200 patients of hand Injuries who attended our OPD and EMERGENCY over a period of one year from 2019 to 2020 were included in the study.

Results: Most common presentation was fractures & dislocations(38%) followed by abrasions & lacerations(33%). Conservative management was taken for 40% cases and fracture fixation was done for 36% cases. 15% cases went for primary amputation and 28% cases plastic surgery intervention was needed.

Conclusion: Most of the hand injuries occurred in males due to machinery injuries that ultimately led to some functional impairment of the hand.

KEYWORDS

hand injury, spectrum of injury, functional impairment

BACKGROUND:

Hand injuries are one of the most frequently encountered musculoskeletal injuries. Previous studies have stated that hand injuries account for 10% of all trauma cases^[1] and males have 2.08 times greater risk than females before the age of 65 years. Hand injuries commonly occur due to road traffic accidents, machinery injuries(cutting machines, thresher machines, sugarcane grinders, printing presses etc), sports injuries, fall from height, fall off heavy object, physical assault. They usually have wide spectrum of injuries^[5] like simple abrasions, contusions, incised wounds, lacerated wounds, degloving wounds, tendon injuries, traumatic autoamputations, closed fractures, open fractures, dislocations etc. presentation can be pain, swelling, bleeding, traumatic autoamputation etc. The mechanism of injury description should include the magnitude, direction, point of contact and type of force that caused the trauma. Axial load or "jamming" injuries are frequently sustained during ball sports. Patterns frequently resulting from this mechanism are shearing articular fractures or metaphyseal compression fractures. Industrial settings or other environments with heavy objects and high forces lead to crushing mechanisms that combine bending, shearing, and torsion to produce unique patterns of skeletal injury and significant associated soft tissue damage^[6].

MATERIALS AND METHODS:

In this study we took 200 patients presenting with hand injuries at our OPD and EMERGENCY, from January 2019 to January 2020.

Inclusion Criteria:

- Patients between the age group 18-50 years
- Patients willing to take part in the study

Exclusion Criteria:

- Patients below 18 years and >50 years
- Thermal injury, Electric injury, Chemical injury

All the patients were thoroughly evaluated after taking proper history and followed by appropriate management. The history included the following points

- Age, sex, occupation, hand dominance
- Date of injury, mode of injury, site of injury
- Time interval to presentation(from injury to presentation)
- If associated with any other injury or not

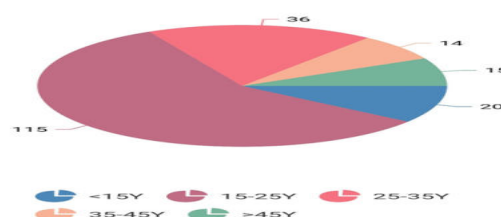
After taking the history, all the patients were clinically evaluated. The patients who had a road traffic accident or fall from height, were assessed following ATLS guidelines. After ruling out presence of life threatening injuries, they were assessed clinically. Those patients who had exclusively hand injuries were taken into the study. All of them were given intramuscular analgesics and tetanus prophylaxis for patients having open injuries. Those not having any open injuries were advised for digital x-ray of the hand anteroposterior and oblique views. Patients with open injuries were examined thoroughly; simple incised wounds and lacerated wounds were closed with non-absorbable sutures; those with degloving injuries, open fractures, traumatic autoamputations were given thorough pulsatile lavage with normal saline after proper debridement of necrotic tissues and unhealthy tissues. Wounds were made clean from foreign materials, muds, dusts and saline soaked sterile gauze dressing with cotton padding applied. Below elbow POP slab was applied and after that advised for x-rays. After reviewing the x-rays, those requiring any operative intervention were admitted and after proper blood investigations taken to the operation theatre. Patients with closed minor fractures were managed conservatively and called for followed up in the OPD.

Statistical Analysis:

All data obtained in the study were recorded in MS Excel and analysed using the Statistical Package for Social Sciences (SPSS), for windows, version 16. Numerical variables were given as mean and standard deviation (SD). P values below 0.05 were considered statistically significant.

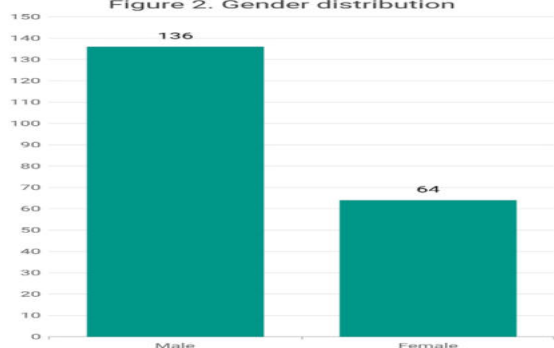
RESULTS:

Figure 1. Age



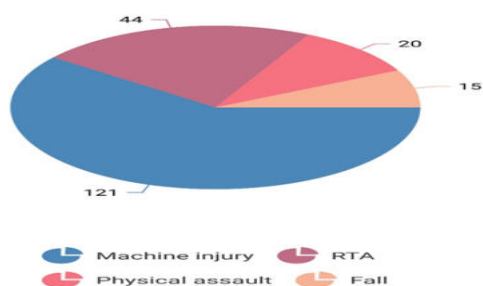
- 57% patients were in the age group between 15-25 years

Figure 2. Gender distribution



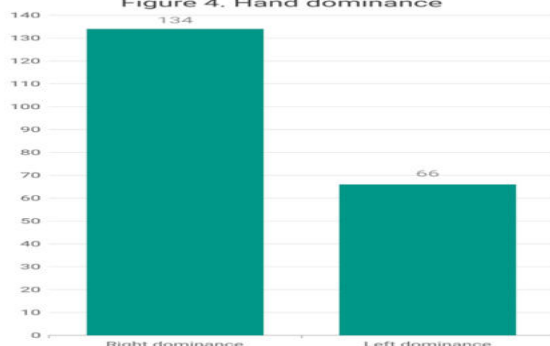
- 68% Patients Were Male Patients

Figure 3. Mode of injury



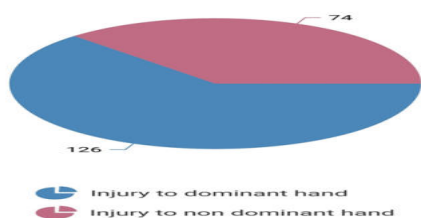
- 60% patients had machinery injury

Figure 4. Hand dominance



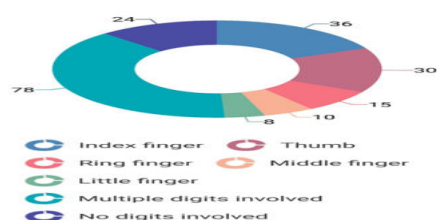
- 67% Patients Were Right Handed

Figure 5. Injury to dominant hand



- 63% patients had injury to their dominant hand

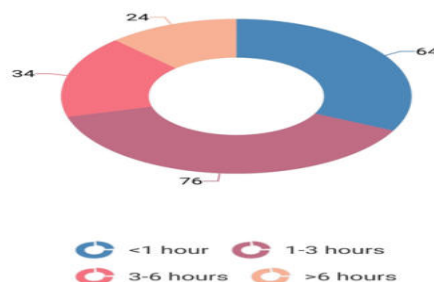
Figure 6. Injury to fingers



- 39% patients had multiple fingers injured and among single digits,

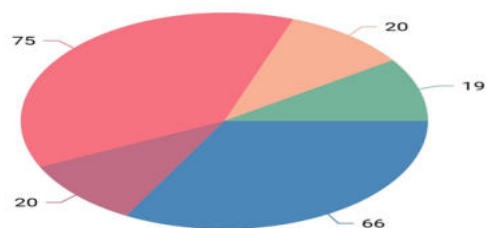
index finger was most commonly involved(18%), followed by thumb(15%).

Figure 7. Time of presentation



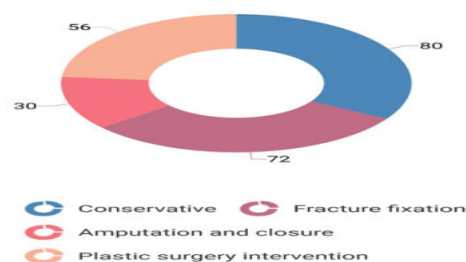
- 38% patients presented within 1-3 hours and 32% patients presented within 1 hour

Figure 8. Type of injury



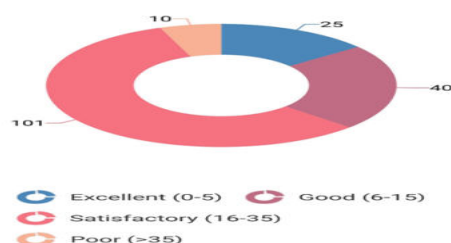
- 37.5% patients had fracture and dislocations and 33% patients had abrasions, incised wounds, chop wounds, lacerated wounds.

Figure 9. Management



- 40% patients were managed conservatively and in 36% cases, operative fixation was needed.

Figure 10. DASH Score



- Functional outcome of these hand injuries were evaluated using

DASH(disabilities of the arm, shoulder and hand) score. 24 patients lost to follow-up eventually so DASH score was studied among 176 patients. 57% patients had satisfactory DASH score and 20% patients had good DASH score.

Clinical Photographs:



Pic 1: Crush Injury Due To Road Traffic Accident(Hit And Runover By Truck)



Pic 2: Traumatic Autoamputation Of Middle And Distal Phalanx Of Index Finger By Machinery Injury



Pic 3: lacerated wound over middle phalanx over middle finger by physical assault



Pic 4: Fracture Of Middle Phalanx Of Middle Finger By Physical Assault

DISCUSSION

Males were predominantly involved compared to females and most commonly 15-25 years of age group were the victims whereas according to other studies mean age of the patients was 27.41 years^[6], 37.2 years^[14], 26.9 years^[15] but in our study mean age was 30.1 years. Acc. To Murtaza et al^[6] work place injuries occurred in 74% of the patients and 16% of the patients had a road traffic accident; in our study, 60% patients had injuries by machinery injury followed by road traffic accidents(22%). According to the study done by Hill et al,^[12] Right and left hands were affected with similar frequency i.e. 51.8% and 45.4% respectively whereas in our study, 67% patients were right handed and 63% patients had injuries to their dominant hand. According to Rohini et al. index finger was most commonly injured single finger (17.5%) and 32% patients suffered from multiple finger injuries^[2] but in our study, 39% patients had multiple digits involved and among single digit involvement, index finger was most commonly involved(18%) and little finger least involved(4%). 38% patients came to hospital within 1-3 hours of injury and 32% patients came within 1 hour of injury. Patients who presented within one hour of injury, had comparatively better functional outcome(DASH score) than patients who presented after one hour of injury. Most of the hand injuries were closed injuries in the form of fracture & dislocations(37.5%), open injuries like abrasion, incised wounds, lacerated wounds were associated with 33% hand injuries and 20% patients had crush injuries and traumatic autoamputations. 40% patients were managed conservatively by appropriate case specific forms like buddy strapping, below elbow slab in functional position of the hand, thumb spica slab etc. 36% patients required operative interventions and most of the cases k wires were used for fracture fixation along with or without below elbow slab. Digits that could not be salvaged went for primary amputation and closure in 15% patients. In 56 patients, plastic surgery intervention(skin grafting, flap coverage) was required. Functional outcome of these injuries were evaluated using DASH score among 176 patients and among them 57% had satisfactory score, 20% had good score, 12.5% had excellent score and poor outcome was seen in 5% patients.

CONCLUSION

Hand injuries are one of the most common injuries in our day to day life. Modern civilization, industrialization, overcrowded roads, carelessness, stressful life, violence etc. are associated factors in road traffic injuries, machinery injuries, physical assault leading to hand injuries. Hand is a complex structure of our body because of its anatomy and function. Even if appropriately diagnosed and treated within time, hand injuries can lead to severe impairment of its functions. Therefore early presentation, careful assessment and management can prevent significant impairment and lead to satisfactory outcomes.

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