

## Industrial Thumb Injuries – A Review of 63 Cases

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**H**AND injuries suffered by worker in industry is extensively documented (Balakrishnan 1962, Banerjee 1963, Boyes 1964, Clarkson and Pelly 1962, Flynn 1966, Mukherjee 1977, Rank et al. 1973, Reid 1966 and Sen 1975). Thumb injuries are of special importance as total dysfunction constitutes a disability rating of 40 per cent (Swanson 1964). This paper concerns the experience of thumb injuries as treated at an E.S.I. Hospital in the industrial township of Faridabad near New Delhi.

### Material and Methods

Sixty three patients with thumb injuries were treated during the period January 1971 to December 1972. Forty two had to be admitted for treatment and twenty one were treated as out-patients. All the patients were males. Their age distribution is shown in Table I.

The right thumb was injured in 32 cases and the left thumb in 34. Three patients suffered injury to both thumbs. None sustained the injury under the effects of alcohol or drugs.

The number of educated workers was

Table I

No.	Age Group	No. of patients
1.	15 to 20 years	15
2.	21 to 25 years	25
3.	26 to 30 years	15
4.	31 to 35 years	4
5.	36 to 40 years	2
6.	Over 40 years	2
Total		63

25 (39.7%) of these 63 had primary education, 18 completed secondary school education while four were graduates. Experience at working on the machine that was responsible for the accident is shown in Table 2. It was noticed that during the harvesting season the skilled labour often go away on long leave and inexperienced labour is employed to fill in the gap.

A variety of machines were responsible for accidents—power press, chain pulleys, steel rollers, lathes, die-casting machines, grinders, cement mixers, fans, cutters, gears, compressors, band saws, belts of moving machinery, hammers and wrenches. The nature of the injuries also were varied—lacerated wounds, skin and nail avulsions, fractures of the first

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metacarpal and phalanges, "burst" wounds and severance of tendons and digital nerves. In ten patients there was partial amputation of the thumb. Associated injuries to other parts of the hand were present in 29 patients. These included skin avulsions, fracture of metacarpals, and phalanges, serial lacerated wounds over the fingers, partial amputation of digits, wounds on the palm and wrist, and in one case "degloving" of the whole hand.

Most of the injuries (45 cases) required only debridement and suture. Split skin grafting was required in nine patients. Abdominal flaps or tube pedicles were necessary in five patients. Tendon and nerve repair was done in seven cases. Interosseous fixation and pollicisation of the index finger were done in one patient each.

The time of day when the accident

occurred is shown in Table 3. The shift hours in the factories are (i) 0700 hrs. to 1500 hrs. (ii) 1500 hrs. to 2300 hrs., and (iii) 2300 hrs. to 0700 hrs.

### Discussion

Clarkson and palley (1962) reported that hand injuries constitute 23% of all industrial injuries. Industries provide 50% to 60% of all hand injuries. Rank et al. (1973) stated that accidents in industry are the dominant cause of hand injuries in metropolitan areas. Approximately one third of the general factory rate concerns the hand, but the proportion varies in different industries. Flynn (1966) also found that one third of occupational accidents involve the hand. Most accidents occur from operating machinery, handling objects and using hand tools. Moving machines are dangerous, such as belts and pulleys, gears, power presses, revolving shafts and rollers. Unfortunately no

Table 2

No.	Duration of Experience	Number of Patients	Percentage
1.	More than 5 years	17	28.2
2.	2 to 5 years	11	15.9
3.	6 months to 2 years	7	11.4
4.	Less than 6 months	9	13.1
5.	No experience	19	31.4
		63	100

Table 3

No.	Time of Day	No. of Cases	Percentage
1.	0700 to 1500 Hrs.	29	45.9
2.	After 1500 Hrs.	14	22.3
3.	Not recorded	19	31.8

comparable statistics for the incidence of industrial injuries is available in our country.

The injuries in the present series varied in their nature and severity. The damage caused depends on a number of factors—power and speed of the machine, the part of the moving machinery actually causing the injury, the duration of time the digit is caught in the machine, timely stoppage of the machine either automatically or by a fellow-worker, safety guards, degree of contamination, the time interval between injury and definitive treatment and the skill and experience of the surgeon. Infection adds greatly to the disability. The extent of damage due to associated injuries also influence the duration of treatment before the patient is fit to resume his work.

The majority of the patients were young males, the wage-earners of their families. A common habit amongst semi-skilled and unskilled workers in our country is that after a full day's work they often take up a part-time job to augment their income. Hence they report for work at the factory the next day fatigued and as seen from Table 3 the majority of accidents occur during the first shift. Duration of experience at work on a machine does not appear to have a bearing on the occurrence of accidents. Familiarity seems to breed contempt for safety measures. The same finding is also true for educational qualifications. Fatigue, over confidence, ignorance, poor "risk-taking" behavior and unsatisfactory house-keep-

ing in the factory, all contribute to a steady incidence of industrial injuries.

The surgical procedures reported were standard ones. Early and correct surgical repair reduces healing time and restoration of function is not further impaired. Rank et al. (1973) stress that medical care of patients with hand injuries must extend well beyond the confines of its particular concern with healing and restoration of anatomy and function. It must also include long term personal and economical considerations.

Unfortunately, long term follow-up studies could not be done for many patients due to the transfer of the treating surgeon. Such studies are difficult as they depend on not wholly verifiable conclusions as to what the patient really thinks and feels. The human factor restricts scientific investigation and causes emphasis to be placed on an intuitive approach. The absence of universally accepted standards of description for data such as the degree of "functional skill" or "reaction to disability" makes the tabulation and appraisal of findings unreliable (Haddow et al. 1964).

It is useful to distinguish between host, agent and environmental contributions. The treating surgeon ought to visit the factory and examine the site of the accident. Modification of human behavior is much more difficult than rendering the environment at least moderately safe.

### Summary

Sixty three patients with thumb in-

injuries caused in industrial accidents have been reviewed. Some of the factors bearing on such injuries have been briefly discussed.

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