

## **AGE ESTIMATION OF INJURY FROM ABRASION -A CLINICAL STUDY FROM NORTH INDIA**

**Dr S. S. Sandhu**, Associate Professor, Forensic Medicine, Gian Sagar Medical College, Ram Nagar, India.  
**Dr RK Gorea**, Professor & Head, Forensic Medicine, Gian Sagar Medical College, Ram Nagar, India.  
**Dr. J Gargi**, Professor and Head, Forensic Medicine, Government Medical College, Amritsar, India.  
**Dr. Anil Garg**, Assistant professor, Forensic Medicine, Gian Sagar Medical College, Ram Nagar, India.

### **Abstract**

Mechanical injuries in form of abrasions are important injuries present in various types of police informed as well as medico-legal cases such as accidents and assault cases. Color of abrasions and its other associated features gives us clue about the approximate range of time since accident or assault. In this study, injured person coming/brought to the emergency wing for medico-legal examination were studied for changes in appearance with passage of time.

**Keywords:** Abrasion, Grazed abrasion, Scab, Mechanical injuries.

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### **Introduction**

The various weapons used by man for causing injuries are as old as man himself. From the beginning of very dawn of civilization, man has employed, manufactured and used various weapons which may cause injury. Looking from this angle, blunt weapons were certainly the earliest allies of man in their battle for existence in a hostile environment. The various tools and instruments were used by man for purposes like cultivation, harvesting, carpentering and other day to day requirements and avocations of life, have all been used as weapons, offensive as well as defensive in the hours of their needs to cause injuries.

To determine the age of injuries is one of the most important aspect in clinical forensic medicine work because this aspect is related to the time of occurrence of the crime. To know the time of certain events e.g. accidents, quarrels is of vital importance in the reconstruction of the chain of events. Filling the blank of time gap helps the investigating

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(Corresponding Author)

**Dr S. S. Sandhu**

Phone: +919915731073

Email: forensicfaculty@giansagar.com

police officer to come to the facts and can also make conclusion whether the injuries are as a result of single or split events. Abrasions are superficial injuries which involve only outer layers of skin [1]. Being trivial scratches or grazes are of no surgical importance, but these are never too small or insignificant to be ignored in medico legal investigations, they may be the only indication of severe internal injury e.g. head injury [2].

True abrasion will heal without leaving a scar. Many abrasions classified as abrasions, however, have some deeper areas of sub epidermal damage which may result in superficial scarring. These are produced by a blow, a fall or sliding on rough surface or being dragged in vehicular accident cause grazing whereas the one caused by finger nails, thorns, by teeth bites or by friction pressure or strings or ropes tied around the neck or other parts of the body, on breast and inner part of thigh in sexual assault. Abrasions vary in size and shape and bleed very slightly. These blunt force injuries are hardly of any significance from the point of view of loss of life but medico legally they are of great importance. Abrasions are also caused by pressure impact of vehicle tyres causing imprint abrasions. [3-14]

**Material and methods**

This study was carried out in Government Medical College Amritsar. In this study one hundred and fifty cases were examined. Injured person coming/brought to the emergency wing for medico legal examination were selected from those cases, which had no previous treatment and were having abrasions on their body. Detailed history was taken; time of infliction of injuries was recorded as alleged by the victim/attendants and corroborated by the statements recorded by the investigating police officer, where possible. Time of first examination was recorded and the documentation of abrasions/injuries on the person was done. Repeated subsequent examination of each case was carried out to record various changes after a time interval of 6 hours, 12 hours, 18 hours, 24 hours, 36 hours, 48 hours, three days, five days, seven days, ten days or more was carried out.

**Observation & discussion**

In this study, 36% (54/150) belonged to rural background and 54% belonged to urban background among the injured selected. Linear abrasions (Table 1) were seen in 40 % (60) of cases, grazed abrasions in 56 % (84) and imprint abrasions in 4 % (6) cases. Grazed abrasion was the commonest type of abrasion seen in this study (Fig. 1).

Table 1  
Types of Abrasions

| Types of abrasion. | Number of cases | %   |
|--------------------|-----------------|-----|
| Graze.             | 84              | 56  |
| Linear             | 60              | 40  |
| Imprint.           | 6               | 4   |
| Total              | 150             | 100 |

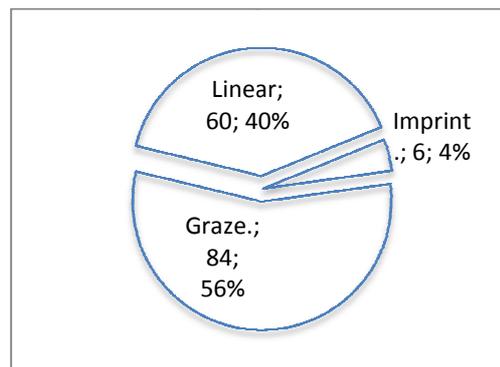


Fig. 1 Distribution of various types of abrasions

41.34% (62) cases were in the age group of 21-30 years and this is the age group in which abrasions were seen maximum (Table No. 2). The least common group is 61 years and above in which it was just 3.34 % (5) cases. There was no case in the age group of 0-10 years.

Table 2  
Age & Sex-wise Distribution

| S.No.  | Age groups   | Mal es | %    | Fema les | %    | Tot al. | %     |
|--------|--------------|--------|------|----------|------|---------|-------|
| 1.     | 0-10         | -      | -    | -        | -    | -       | -     |
| 2      | 11-20        | 12     | 8    | 2        | 1.33 | 14      | 9.33  |
| 3      | 21-30        | 54     | 36   | 8        | 5.33 | 62      | 41.33 |
| 4      | 31-40        | 30     | 20   | 6        | 4.00 | 36      | 24    |
| 5      | 41-50        | 21     | 14   | 2        | 1.33 | 23      | 15.33 |
| 6      | 51-60        | 8      | 5.33 | 2        | 1.33 | 10      | 6.66  |
| 7      | 61 and above | 4      | 2.67 | 1        | 0.67 | 5       | 3.34  |
| Tot al |              | 129    | 86   | 21       | 14   | 150     | 100   |

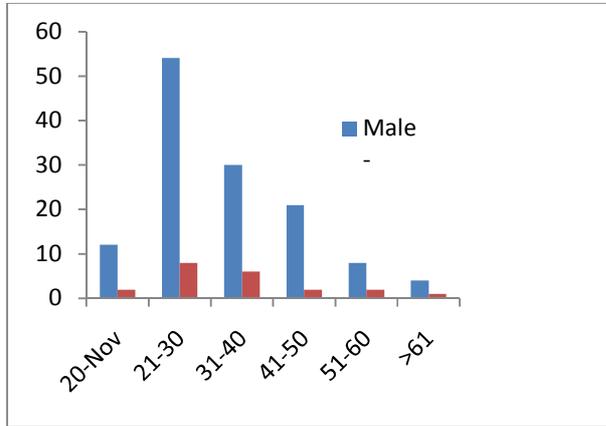


Fig. 2: Distribution of Different features of abrasion in relation to different time groups. (at first examination).

**At first examination**

Maximum numbers of cases i.e. 37.33 % (56) were seen during the time interval of 0-6 hours with bleeding and oozing seen as a prominent feature during this time in all cases except one case where dried blood was seen. In 22 % (33) cases seen during interval of 7-12 hours bleeding and oozing was seen in twice the number of cases as compared to dried blood. Only 3.33% (5) cases were seen in time interval of 13-18 hours out of 5 cases in this group 3 cases depicted bleeding and oozing and two cases showed dried blood. In the interval of 19-24 hours 13.34 % (20) cases were seen, when reddish scab formation was seen in 4 cases out of 20 and in rest of the 16 cases dried blood was seen. 6% (9) cases were present in 25-36 hours duration, still the dried blood was present in double the number of cases than reddish scab, whereas reddish scab appearance was 4 times more common as compared to dried blood in the time group 37-48 hours and 49-72 hours. The scab started turning reddish brown in 50% of cases in 49-72 hours.

Table No. 3  
Time interval at first examination of abrasions

| Time Group | Bleeding | Oozing | Dried Blood | Reddish Scab | Reddish | Brown Scab | Shedding Off | Complete | Shed Off Scab Discolored | Skin | Normal Skin | No. of Cases | %      |
|------------|----------|--------|-------------|--------------|---------|------------|--------------|----------|--------------------------|------|-------------|--------------|--------|
| 0-6 h      | 5        | 5      | 1           | -            | -       | -          | -            | -        | -                        | -    | -           | 5            | 37.3   |
| 7-12 h     | 2        | 2      | 1           | -            | -       | -          | -            | -        | -                        | -    | -           | 3            | 22.0   |
| 13-18 h    | 3        | 2      | 2           | -            | -       | -          | -            | -        | -                        | -    | -           | 5            | 3.33   |
| 19-24 h    | -        | 6      | 1           | 4            | -       | -          | -            | -        | -                        | -    | -           | 2            | 13.3   |
| 25-36 h    | -        | 6      | 6           | 3            | -       | -          | -            | -        | -                        | -    | -           | 9            | 6.00   |
| 37-48 h    | -        | 1      | 1           | 4            | -       | -          | -            | -        | -                        | -    | -           | 5            | 3.33   |
| 49-72 h    | -        | 1      | 1           | 4            | 5       | -          | -            | -        | -                        | -    | -           | 1            | 6.67   |
| +3-5 days  | -        | -      | -           | -            | 4       | 3          | -            | -        | -                        | -    | -           | 7            | 4.67   |
| +5-7 d     | -        | -      | -           | -            | 1       | 1          | 1            | -        | -                        | -    | -           | 3            | 2.00   |
| +7-10 d    | -        | -      | -           | -            | -       | 1          | 1            | -        | -                        | -    | -           | 2            | 1.33   |
| Total      | 8        | 0      | 8           | 1            | 5       | 1          | 2            | -        | -                        | -    | -           | 50           | 100.00 |

The scab started shedding off in 3 cases out of 7(4.67%) cases seen during + 3-5 days and rest of the cases were showing reddish scab. We had just 3(2%) cases in the time interval of + 5-7 days in which one case showed reddish brown scab, one case showed partial

shedding of scab and one case showed complete shedding of scab was observed in one case each in the time group of + 7-10 days.

**During follow up**

Out of 56 cases examined during 0-6 hours bleeding and oozing was present in 55 cases and in one case dried blood was seen. Out

complete shedding. Partial shedding of scab and of these 56 cases, in the time interval of 7-12 hours 22 cases still depicted bleeding and oozing where 34 cases depicted reddish scab formation. This is in conformation of findings of other authors.

In the time interval of 13-18 hours out of 89 cases 4 cases still depicted bleeding and oozing whereas rest of 85 cases showed reddish

Table 4  
During follow up

| S. No | Features               | 0-6 hrs | 7-12hr | 13-18hr | 19-24hr | 25-36hr | 37-48hr | 49-72hr | +3-5 | +5-7 | +7-10   |
|-------|------------------------|---------|--------|---------|---------|---------|---------|---------|------|------|---------|
| 1     | Bleeding Oozing        | (55)    | 22*    | 4*      | -       | -       | -       | -       | -    | -    | -       |
| 2     | Dried Blood            | (1)     | (11)   | (2)     | (16)    | 6       | (1)     | (1)     | -    | -    | -       |
| 3     | Reddish Scab           | -       | 34*    | 85*     | 94*     | 103*    | 74*     | 4*      | -    | -    | -       |
| 4     | Reddish Brown Scab     | -       | -      | -       | -       | 11*     | 49*     | 112*    | 21*  | 4*   | 1*      |
| 5     | Partial Shed Off Scab. | -       | -      | -       | -       | -       | -       | 11*     | 70*  | 19*  | 5* (1)  |
| 6     | Complete Shed off Scab | -       | -      | -       | -       | -       | -       | -       | 47*  | 70*  | 14* (1) |
| 7     | Discolored Skin.       | -       | -      | -       | -       | -       | -       | -       | -    | 52*  | 63*     |
| 8     | Normal Skin            | -       | -      | -       | -       | -       | -       | -       | -    | -    | 65*     |
| 9     | Pus Formation          | -       | -      | -       | -       | -       | -       | 1*      | -    | -    | -       |
| 10    | Total                  | 56      | 89     | 94      | 114     | 123     | 128     | 138     | 145  | 148  | 150     |

- Indicates cases from previous column total,
- ( ) cases indicates original cases seen on first examination as per table 3

scab formation. This is in conformation of findings of other authors

Out of 94 old cases during the time group of 19-24 hours all the old cases still had

the appearance of reddish scab. This pattern persisted in the time group of 25-36 hours except in 11 and 6 cases in which color change of scab was reddish brown and dried blood was present respectively.

In the time group of 37-48 hours, out of 123 old cases, 74 cases still had the appearance of reddish scab there as 49 cases showed reddish brown scab.

On 49-72 hrs, 4 cases showed reddish scab, 112 cases showed reddish brown scab and 11 cases showed partial shed off scab out of these 128 cases in 37-48 hrs group. Although the range for reddish scab is 12-72hrs, but maximum number of cases fall in 12-48 hrs.

On the + 3<sup>rd</sup> to 5<sup>th</sup> day out of old 138 cases 21 cases still had reddish brown scab whereas 70 cases showed partial shedding of scab and there was complete shedding of scab in 47 cases.

On + 5-7 days intact reddish brown scab was present in 4 cases only and 19 cases depicted partial shedding of scab and in 70 cases complete shedding of scab was observed and rest of 52 cases out of old 145 cases showed discolored skin. Although the range for reddish brown scab is 36 hrs to 10<sup>th</sup> day, but maximum number of cases are falling in 36 hrs to 5 days which is more as compared to 2-3 days range given by other authors.

Although the range for partial shedding of scab is 3 days to 10 days, but maximum number of cases are falling in 3 to 7 days which is in conformation of findings of other authors.

During + 7-10 days time interval out of 148 old cases 65 had the skin with normal color, 63 still had discolored skin and in 14 cases complete shedding of scab was taking place but one case still had the reddish brown scab and in 5 cases partial shedding of scab was present. Although the range for complete shedding of scab is 5 days to 10 days, which is not in conformation of findings of other authors.

### Conclusions

Conclusion of this study is as under:-

- i. The average duration of bleeding and oozing within a range 18 hrs.
- ii. The average duration for the formation of reddish scab is within a range of 12-72 hrs.

- iii. The average duration of formation of reddish brown scab is within a range of 36 hrs to 10<sup>th</sup> day.
- iv. Partial shedding of scab is seen within a range of 3 days to 10 days.
- v. Complete shedding of scab is seen within a range of 5-10 days.
- vi. Discolored skin is seen within a range of 7-10 days.
- vii. Normal skin is observed from 10 days onwards.

### Conflict of Interest

None declared.

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