Case Report

Utility of X-Rays in Scar Examination: A Case Report

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Abstract

In Forensic practice scar is utilized for identification purpose. The identification may be of personal identification or to identify any previous injury. In this case report we are reporting the radiological findings of the scar and discuss the utility of such technique. A 32 year male accused was referred by the City Police for examination of scar. Forensic examination of scar provides vital information like type of injury sustained, type of weapon used and probable age of scar. Along with clinical examination, radiological evaluation in suspected of cases of firearm may provide valuable clue like old fractures, deformity, callous formation and firearm residue. If facilities are available like multi-slice spiral CT scan then radiological evaluation become easier. The advantages of such techniques are considerable like one can visualize the image in Bone Window and Volume Render Technique format; one can have three dimensional view and therefore the image can be rotated and visualized in 360 degree. The present case highlights the importance of utilizing the radiological modality while examining the scar for medico-legal purpose.

Key Words: Identification, Scar, Firearm, X-Ray, Radiology

Introduction:

In Forensic practice scar is utilized for identification purpose. The identification may be of personal identification or to identify any previous injury. While relating the scar with previous injury, the appearance and age is considered and accordingly opinion is given.

Scars are permanent and usually assume the shape of wound causing them. Scars produced by firearm wound are usually circular or oval with central depression. In an order to confirm that the given scar was produced by firearm, radiological evaluation may be needed. [1] In this case report we are reporting the radiological findings of the scar and discuss the utility of such technique.

Case Report:

A 32 year male accused was referred by City Police for examination of scar. There was alleged history that about 3 months back he was having a quarrel with his rival and during that the rival had used firearm and wounded him.

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Then the accused had visited private surgeon who had treated him and removed the projectile. To take the revenge a week back he had killed that rival. City police had arrested him as an accused. During investigation police came to know the purpose of killing. To confirm the past incident, police asked for medical help. Accordingly the accused was examined at casualty department.

On examination following were noted:

1. Old scar mark of size 0.8cm x 0.6cm, oval shaped, dark brown in colour , centrally depressed with shiny white fibrous tissue at places; present over anterior aspect of left thigh, 10cm above left knee, sensitive to touch with relatively smooth surface. (Fig. 1)
2. Two small circular depressed dark brown old scar mark of size 0.3cm in diameter present near medial and lateral margins.
3. A healed sutured wound present as a linear scar of length 7cm x 0.5cm, present over anterior aspect of left thigh, 7cm above left knee, vertically placed with suture mark impressions six in number.
4. A healed sutured wound present as a linear scar of length 4cm x 0.5cm present over posterior aspect of left thigh, 4cm above popliteal fossa, vertically placed with suture mark impressions, five in number. (Fig. 2)
5. Lateral and Antero-posterior x rays were requested that revealed evidence of old healed fracture of femoral shaft in lower third of left femur with callus formation and

minimal deformity with dense radio opaque foci seen in lower left thigh suggestive of metal particles. (Fig. 3)

Discussion:

A scar is fibrous tissue produced because of healing of wound. It is formed through a highly organized sequence of physiologic events. [2] It is covered with epithelium and devoid of hair follicles, sweat glands and pigments. Scar tissue is never strong like normal skin.

The primary component of scar is collagen. The period of maximal collagen production is the first 4 to 6 weeks after injury.

During this period the scar appear red, slightly firm and raised. Over the next several months the production and degradation of collagen occurs. Normal healing results in normal type of scar and on the surface the normal healing is noted by the fading of redness and softening of the scar.

However, at times, excessive scar forms as a result of aberrations of physiologic wound healing and manifested as hypertrophic scarring. [3] Historically, early application of X-ray in Forensic Medicine was introduced in 1896 just one year following the X-ray discovery by Prof. Arthur Schuster (1851-1934) of Owens College, Manchester in England, to demonstrate the presence of lead bullets inside the head of a victim. [4] The use of radiology in the investigation of firearm fatalities has been a standard practice since then. However CT offers significant advantages over plain film X-rays.

The evaluation is much easier done in 3D CT-images than in 2D plain radiographs. [5]

Detection of firearm residue in and around the entrance wound is of great help to determine the entry wound. Forensic examination of scar provides vital information like type of injury sustained, type of weapon used and probable age of scar.

Along with clinical examination, radiological evaluation in suspected of cases of firearm may provide valuable clue like old fractures, deformity, callus formation and firearm residue. In the present case there was alleged history of firing and the person had taken surgeon's help to remove the projectile.

From the shape of scar it appeared to be caused by firearm and on X-ray there is old healed fracture with callus formation with radio-opaque foci suggestive of metal particles.

Similarly therapeutic suture wounds were noted suggesting a therapeutic intervention. Therefore considering all the findings it was deduced that the scar mark was because of firearm wound.

Without X-ray finding, it would have been difficult to opine in this case. If facilities are available like multi-slice spiral CT scan then radiological evaluation become easier.

The advantages of such techniques are considerable like one can visualize the image in Bone Window and Volume Render Technique (VRT) format; one can have 3 D view and therefore the image can be rotated. Thus the lesion can be visualised from all sides i.e. anteriorly, laterally and posteriorly.

In conclusion the present case highlights the importance of utilizing the radiological modality while examining the scar for medico-legal purpose.

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Fig. 1 A: Oval Scar Mark and Suture Scar Mark

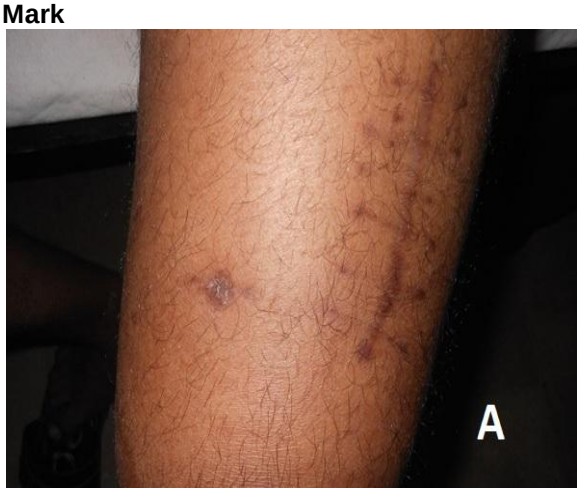

Fig. 1B: Zoom Picture of Oval Scar Mark

Fig. 2: Suture Scar on Posterior Aspect

Fig. 3: X-Ray AP View Showing Old Healed Fracture of Left Femur with Callous Formation, Minimal Deformity with Dense Radio-Opaque Foci