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Surgical Management of Traumatic Head Injury (Wound) in a Dog: A Case Report

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Abstract: A two-year-old mix breed hunting dog weighing about 12 kg was presented to the small animal ambulatory of the Veterinary Teaching Hospital of Michael Okpara University of Agriculture Umudike, with complain of accidental machete wound on the head. On physical examination, the rectal temperature, respiratory and pulse rates were within the normal range, Physical examination also revealed a clean head injury. The injury was treated surgically by primary wound closure following sedation with xylazine (XYL-M2 V.M.D.s.a/n.v. Hoge Mauw 900 B-2370 Arendonk Belgium) at a dose rate 0.15mg/kg. The affected surgical field was shaved, cleaned and lavaged. Lignocaine 2% was infiltrated around the wound edges for analgesia. The wound was closed in 2 layers' technique. The first (subcutaneous) layer was closed using absorbable suture material in a simple continuous suture pattern, while the second layer (Skin) was closed with non-absorbable suture material using horizontal mattress pattern. Topical Antibiotic (Penicillin ointment® MIM PHARMA. IND. LIMITED. Klm 21, Owode Idiroko Road, Ajibawo Ogun State) was applied as wound dressing, Piroxicam® capsule (NSAD) 20mg (hovid Pharmaceuticals Ltd, 6 Kolawole Odunsi Street, Ikeja Lagos, Nigeria) and antibiotic capsule Cikamox®. 250mg (Amoxicillin) (MICHELLE LABORATORIES, Plot 23 Block 2, Thinkers Corner, Enugu, Nigeria) administered orally for 5 days' post-surgery. Skin sutures were removed 14 days' post-surgery. The wound healed without complications.

Key words: Dog · Head · Machete · Wound · Suture

INTRODUCTION

Wound is an injury in which there is a break in continuity of soft tissues. It can either be open or closed. Open wound occurs in the body covering (Skin or mucus membrane), which can be seen and blood loss evaluated. Such a wound resulted of sharp objects or due to a blow [1, 2]. In closed wound the injury cause no break in the body covering, this occur when a body part or organ is struck by a blunt object, twisted or deceleration force. It cannot be seen and blood loss is difficult to evaluate [1-3].

Wound can be caused intentionally as in surgery, or accidentally (unintentional) as in trauma. Wound can be classified as superficial when it did not go beyond the epidermal layer of the skin or as deep (penetrating) when it involves the skin as well as deeper tissues or organs. Wound may also perforate to the deeper layers when a foreign object enters and exits an internal organ [1, 3].

A clean wound contains no pathogenic microbes and this includes all the surgical wounds that did not enter the alimentary, respiratory and urogenital systems. A clean-contaminated wound is aseptic but enters the gastrointestinal tract and urogenital tract. Contaminated wounds are open traumatic wounds with presence of pathogenic microbes, the tissues are not healthy and is associated with signs of inflammation [1-3].

The basic fundamental principles in wound management is evaluating the wound as described above and preparing the wound for closure either by primary or secondary intentions depending on the outcome of the evaluations [1, 4]. In either primary or secondary intention closure, the area around the edges is clipped of hair, lavaged with normal saline, scrubbed with mild antiseptic and debrided of dead tissues if any to leave only viable tissue [1, 4].

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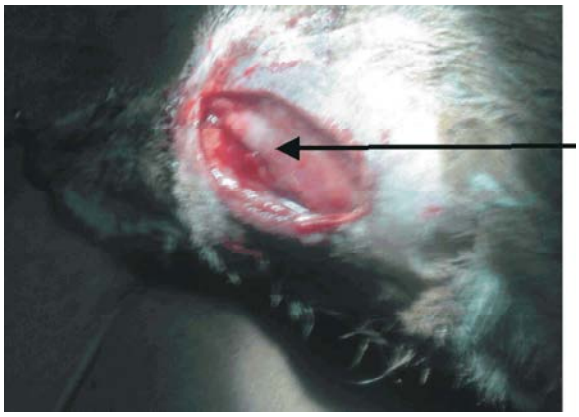

Fig. 1: Head injury (Wound) arrowed.

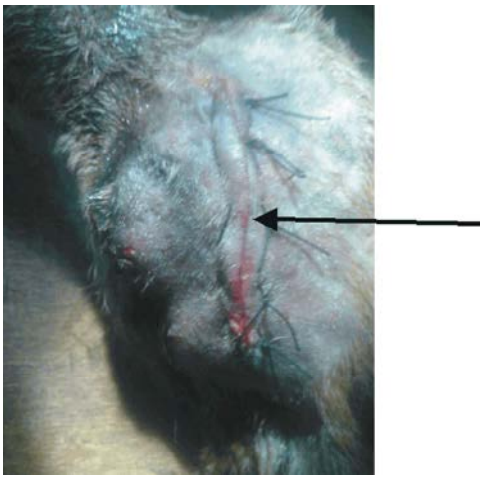

Fig. 2: Apposed woud edges (Arrowed)

Fig. 3: Wound at day 14 after removal of stiches.

The wound can then be closed by primary or secondary intentions. Primary intention closure is considered when the time lapse since the injury is less than six hours, there is good haemostasis, no tissue tension or dead space, minimal tissue trauma and contamination and thorough debridement and lavage have been done. In secondary intension closure, infection and trauma necessitate management of the wound for three to five days so that healthy granulation tissue formed before closure [1, 4].

Case Report

History: A two-year-old mix breed hunting dog weighing about 12 kg was presented to the small animal ambulatory of the Veterinary Teaching Hospital of Michael Okpara University of Agriculture Umudike, with complain that he accidental injured the head of dog with a machete during their hunting outing the previous day (Fig 1).

Physical Examination: On examination the dog was dull and the wound apparently clean due to the application of penicillin ointment by the hunter. Rectal temperature was 38.0°C, the pulse rate was 95 bpm, the respiratory rate was 36 cpm and the heart Rate 96 bpm. The age and weight of the dog were estimated to be about 2 years and 12 kg respectively.

Surgical Management: The dog was sedated with xylazine at 0.05mg/kg intravenously, the area around the wound was shaved and scrubbed, the wound was then lavaged to remove hair particle. Lignocaine 2% was used as local anaesthetic by infiltrating around the wound edges to achieved analgesia. The wound edges was then pulled together by traction using Allis tissue forcep and a subcutaneous suture applied to apposed the subcutaneous tissue with catgut (Absorbable) suture material in continuous suture pattern thus reducing the tension on the skin. A tension suture pattern (Horizontal mattress) with nylon (Nonabsorbable) suture material was used to close (Apposed) the wound edges (Skin) (Fig 2).

Post-Surgical Management: Topical Antibiotic (Penicillin ointment® MIM PHARMA. IND. LIMITED. Klm 21, Owode Idiroko Road, Ajibawo Ogun State) was applied as wound dressing, Piroxicam® capsule (NSAD) 20mg (hovid Pharmaceuticals Ltd, 6 Kolawole Odunsi Street, Ikeja Lagos, Nigeria) and antibiotic capsule Cikamox®. 250mg (Amoxicillin) (MICHELLE LABORATORIES, Plot 23 Block 2, Thinkers Corner, Enugu, Nigeria) given 1capsule/day for 5 days. An improvised Elizabethan collar was placed around the neck to prevent self traumatisation of the wound. The Veterinary team revisited after 7 days post surgery to assess the wound healing. On day 14 post-surgery, the stiches were removed (Fig 3). On day 21 the wound has healed appreciably without complications.

DISCUSSION

On presentation, the patient and the wound were assessed to ascertain the damage done to the (Head) tissue and the physiological status of the patient as reported by Adeniran [1], Hassan and Hassan [2] and Jolle and Gert [4].

Wound closure is the art of co-opting wound margin with sutures in order to shorten the healing time and minimise scarring [1, 4]. Due to the location of the wound on the head, traction was applied to the wound edges to properly oppose the skin ensuring that the tension was evenly distributed before the application of stitches. This necessitated the closure of the wound using 2 layers suture technique [1, 4]. For the first layer, size 4-0 chromic catgut (Absorbable suture material) was used to oppose the wound edges subcutaneously in a continuous suture pattern; this was done in order to reduce the tension that will be applied in opposing the skin while closing up the wound [4]. The size of the chromic catgut was chosen because the heavier the suture material employed to stitch; the easier it is to apply greater tension [1]. The continuous suture pattern was chosen because of the less number of knot tying involved (2 knots), one at start and the other at the end, thus minimising tissue reactions. It also provides good apposition and air or water tight seal and promotes suture economy [1]. The second layer was applied on the skin with size 4-0 nylon (No absorbable suture material) in a horizontal mattress suture pattern. This suture pattern is essentially U-shaped with a loop on one side and a knot on the other side of the wound. It is an ideal tension suture when placed properly [1].

Wound healing is the restoration of tissue structure and function by biological process of tissue regeneration or scar tissue formation also referred to as “Repair” [1, 4]. Surgical practice is the creation and repair of wound and essentially the recovery of tissue function, which is based on the healing process [1, 4]. The wound healing process in this case followed the principle of first intention healing [1]. The edges of the wound were united together by the use of sutures, seen in clean, incised wound this does not make granulation tissue visible and there is minimal scar tissue formation [4].

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