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CLINICAL AND RADIOLOGICAL OBSERVATIONS ON THE MANAGEMENT OF COMPOUND FRACTURE OF RADIUS-ULNA IN DOGS

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Both man and animals especially dogs, are often exposed to trauma leading to fracture of bones. The time gap between occurrence of a fracture and the seeking of Veterinary aid by the owner may, many times, decide whether a simple fracture becomes compound or gets contaminated. In canines, radius-ulna are commonly fractured. The fracture may be simple or compound. In compound fracture, the problem of the wounds and bone infection has to be managed additionally. Even the best possible internal or external methods employed for immobilization of compound fractures may fail, if there is a severe wound infection. When the infection is not controlled, healing will be delayed or gangrene may set in and amputation may have to be resorted to. To control such infection, use of antibiotics on the basis of bacteriological culture and sensitivity tests have become common practice. The present report high lights some of the clinical and radiological observations during management of compound fracture of radius-ulna in dogs.

Materials and methods

The study was conducted on 15 mongrel dogs (average weight 13.6 kg) and around one year of age. These were maintained in cages under identical conditions of feeding and management. The dogs were randomly divided in three groups of 5 animals each. In all the animals a compound mid shaft fracture of radius and ulna was created. The repair was undertaken in lateral recumbency, under general anaesthesia, 2, 24, and 72 hours after creation of fracture in groups I, II and III respectively. Wound at the fracture site was kept bandaged (unmedicated) till the repair was undertaken. Routine aseptic technique was adopted.

An hour before surgery, each dog was given 0.5 to 1.0 g streptopenicillin intramuscularly depending upon the weight. Streptopenicillin in 2.5 g vials was dissolved in distilled water for use as an intramuscular injection and as a local spray on the wound before, during and after surgery. After intramedullary pinning, but before spraying streptopenicillin, a swab sample of the wound was taken for culture sensitivity tests. Streptopenicillin was used till results of culture sensitivity tests became available. Subsequently, the antibiotics were used as per the sensitivity results (Table 1). The most effective antibiotic was used parenterally and as a spray locally till 6th post-operative day.

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Table 1 Antibiotic sensitivity against different bacterial isolates from the wound immediately after fracture repair

Sl. No.	Group	Dog No.	Bacterial isolated	Antibiotic Discs						
				Penicillin	Oxytetra-cyclin	Tetracyclin	Chloram-phenicol	Ampicillin	Streptomycin	Co-trimoxazole
1	I	1	*Staph.* spp.	R	S	S	R	S	S*	R
		2	*Staph.* spp.	R	(S)	S	S	R	R	R
		3	*Staph.* spp.	R	(S)	S	R	R	R	R
2	II	1	*Staph.* spp.	R	(S)	S	R	R	R	R
		2	*Staph.* spp.	R	(S)	S	S	R	R	R
		3	Culture lost	(S)	S	S	S	S	(S)	S
		4	Gram-negative Bacilli	R	(S)	S	R	R	R	R
		5	*Staph.* spp.	R	(S)	S	R	R	R	R
3	III	2	*Staph. aureus*	(S)	S	S	S	S	(S)	S
		3	Gram positive Bacilli	R	(S)	S	S	R	R	S
		4	*Bacillus* spp.	(S)	S	S	S	S	(S)	S

* Streptopencillin continued post-operatively, also in the 4 dogs where no bacterial growth occurred.
( ) Antibiotic continued after culture sensitivity test

Post-operative management

The animals were observed daily for signs of illness. The wounds were inspected clinically for inflammatory reactions, presence of wound discharge, pus etc. The weight bearing behaviour of the dogs on the fractured limb after repair was also observed regularly.

Up to 6th post-operative day, respiration, heart rate and temperature were recorded and blood for hematological examination was collected daily.

Dressing of wound was done on 7th, 10th and 12th post-operative day using the same antibiotic as a local spray. Wounds were kept bandaged throughout the period.

After 45th post -operative day, the pin was removed aseptically. After incising skin, swab sample for bacteriological examination was taken first from the tip of the embedded pin and then from body of whole pin after it was pulled out of bone.

Radiographs of lateral and antero-posterio views were taken after creating fracture, immediately after repair, and on 15th, 30th and 45th post-operative day.

Results and discussion

During the post-operative phase of the present study, all the cutaneous wounds were observed to be healthy and healing satisfactorily. Wounds healed well by 15th post-operative day. There was no swelling or discharge or pus formation in the wounds of any of the 15 dogs. Dogs started bearing weight on affected limb on 3rd post-operative day. The wounds were dry when opened for routine dressings. In a few cases in which the bandages slipped (or was undone by dogs) during post-operative period, a sudden spurt in bacterial counts was noted. This fact highlights the importance of proper bandaging and maintaining the bandage intact to avoid contamination. In these cases, too, wound healed satisfactorily and without complication. The radiographs taken at 15, 30 and 45 post-operative days indicated satisfactory healing of fractured radius and ulna. At 45th day, the callus had fully bridged the fractured ends. All the dogs were bearing weight and functional status of the fractured limb had been restored. No pain was evinced on palpation of fractured part and the adjacent joints were flexible. All the animals were active, alert, and taking food and water normally throughout the period of observation. The retrograde method of intramedullary pinning for radius - ulna fracture in dogs and the post-operative management, as employed in the present study, could be considered satisfactory and effective. During the post-operative phase, rectal temperature and respiration rate remained within normal limits in all the three groups of dogs. Increase in heart rate observed had usually tapered after 4th post-operative day. However, heart rate in general remained within normal limits. Clinical symptom and apparent status of wound and bone healing showed no difference in the three groups of dogs. The pre-operative contamination appeared to be crossing the barriers of good scrubbing and post-operative management with much difficulty.

The hematological findings in the present study appeared to follow the general trend

observed in wound healing. TLC remained high during initial post-operative days. Neutrophils inscreased significantly and lymphocytes decreased significantly on 1st, 2nd and 3rd post-operative days. Singh (1985) observed increase in TLC and associated it with stress during post-operative phase of thoracotomy in dogs. Thomas *et al.* (1977) attributed the rise in the number of WBC to the release of cellular proteinase which induced leucocytic mobilization. Kirov *et al.* (1979) associated the rise in WBC number to the degree of trauma to the tissues. Schmidt and Booker (1982) reported WBC to be the main cellular component which changes in major and minor procedures.

Administration of antibiotics, parenterally as well as locally, proved useful in the management of compound fractures in canines.

Summary

Compound fracture of radius-ulna were created experimentally in 15 clinically healthy mongrel dogs. The fractures were repaired by intramedullary pinning 2, 24 and 72 hours after creation of fractures. All these dogs were given antibiotics both parenterally and locally on the wound, post-operatively. The selection of antibiotics was based upon culture sensitivity tests. The cutaneous wound healed satisfactorily and there was no radiographic evidence of osteomyelitis.

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