6.0 SUMMARY

A study was conducted to evaluate the efficacy of modified tension band wiring with or without hemilaminectomy and non-surgical treatment among 18 clinical cases of traumatic paraplegia in dogs.

The dogs were divided into three groups based on the willingness of the owners to subject their pets to surgery and economic considerations. The dogs of Group I were treated with modified dorsal spinal stapling and tension band wiring without hemilaminectomy, those of Group II were treated with modified dorsal spinal stapling and tension band wiring with hemilaminectomy and the dogs of Group III were treated non-surgically by ultrasound therapy and medications. The results of the study are summarized as follows.

1. The occurrence of traumatic paraplegia among 14,442 clinical cases presented to the hospital over a period of two years was 47 (0.33%).

2. The breed-wise occurrence of the condition indicated it as highest in non-descript dogs (46.81%) followed by spitz (17.02%), German Shepherds (8.51%), Labrador Retrievers (8.51%), Dachshunds (6.37%) and Boxers (4.26%). One dog each belonged to Dalmatian (2.13%), Cocker Spaniel (2.13%), Great Dane (2.13%) and Doberman Pinscher (2.13%) breeds.

3. Younger dogs were more susceptible for traumatic paraplegia. Among the cases, 25.53 percent were between zero and three years of age, 25.53 percent were between three and six years of age, 21.28 percent were between six and nine years of age, 23.40 percent were between nine and twelve years of age, and 4.26 percent were between twelve and fifteen years of age.

4. Males (68.09%) were more commonly affected than females (31.91%).
5. The most common cause for traumatic paraplegia was automobile accidents (53.19%), followed by falling from height (19.15%), attack by man (2.13%) and attack by dogs (2.13%). The remaining dogs (23.40%) had a sudden onset of paraplegia, but did not have a clear history of external trauma.

6. Dogs with pathological conditions affecting the vertebral column like osteodystrophia fibrosa and hemivertebrae became paraplegic after falling from even small heights like from the top of a table or chair.

7. Physical examination was adequate in tentatively determining the site of injury especially in dogs with fractures or dislocations of the vertebral column.

8. Clinical parameters like rectal temperature, heart rate and respiration rate were not significantly affected by traumatic paraplegia or the treatment modalities adopted.

9. Bladder function was one of the first functions to return in paraplegic dogs showing neurological recovery. It could be considered as an early prognostic indicator for neurological recovery in a paraplegic dog.

10. Neurological examination at different intervals during the period of evaluation was efficient in evaluating the effectiveness of the treatment modalities.

11. Absence of deep pain sensation in the hind paws on the day of presentation indicated poor prognosis for recovery after surgical or non-surgical treatment.

12. Grading of paraplegic dogs based on neurological status was easy and useful for evaluating the functional status of the dogs after initiation of treatment. Dogs which belonged to Grade 5 on presentation had poor prognosis for recovery.
13. Lateral radiographs were easy to obtain. Ventro-dorsal radiographs caused a lot of discomfort to the dogs and had to be performed carefully to prevent further damage to the spinal cord, especially in dogs with vertebral fractures or dislocations.

14. Variable levels of callus formation was observed radiographically during the healing of vertebral fractures.

15. The use of diazepam reduced chance of seizures during myelography.

16. The use of iohexol for myelography was not associated with any post-procedural complications like seizures suggesting that the drug was safe for the procedure in all clinical cases of paraplegia. The use of iohexol at the rate of 80 mg/kg bodyweight provided enough contrast for identification of lesions.

17. Digital radiography produced images of better quality compared to those obtained by conventional radiography.

18. Computed tomography was excellent in providing a clear picture of the direction and type of vertebral fractures.

19. Magnetic resonance imaging helped study actual spinal cord compression more clearly than myelography.

20. Atropine and diazepam were useful in reducing salivation and enhancing muscular relaxation respectively during anaesthesia for surgery. Anaesthesia provided by 2.5% solution of thiopentone sodium was satisfactory for performance of surgery in all cases.

21. Modified dorsal spinal stapling and tension band wiring was performed without difficulty in all cases except in those dogs that had fracture of the dorsal spinal processes also.
22. Seromas were a common finding in dogs of Group I and II postsurgically. However, the seromas were larger in Group II. The method of manual drainage of seromas was satisfactory.

23. Haemoglobin, packed cell volume and total erythrocyte count were found to be within the normal physiological range in all dogs during the period of study in all the groups.

24. Total leukocyte count and differential leukocyte count indicated stress leukograms in paraplegic dogs. The values returned to the normal range when the dogs became ambulatory.

25. Serum calcium, phosphorus and potassium values were within the normal physiological range in all dogs on the days of presentation as well as after initiation of treatment.

26. The values of aspartate aminotransferase and alanine aminotransferase were within the normal physiological range in all dogs.

27. The colour, clarity and cell type of cerebrospinal fluid obtained from the cisterna magna in all dogs were normal. Mean values of specific gravity, cell count and total protein were also within the normal range in all dogs.

28. Complications associated with laminectomy membrane formation were not seen in any dog of Group II. This may be because of the use of free fat grafts at the site of hemilaminectomy.

29. The outcome of treatment was better in the surgical groups compared to the non-surgical group. Four (66.67%) of six dogs recovered neurologically in Group I, five (83.33%) of six dogs recovered in Group II, whereas in Group III only two dogs (33.33%) out of six recovered neurologically. Higher recovery was seen in dogs subjected to hemilaminectomy in addition to spinal fixation compared to dogs in which spinal fixation alone was done.
30. The recovery of 66.67 percent of paraplegic cases treated by spinal fixation without hemilaminectomy indicated that hemilaminectomy was not an inevitable procedure while treating traumatic spinal injuries.

31. Complete neurological recovery of dogs presented 15 days (two dogs), 30 days (two dogs) and 47 days (one dog) after sustaining trauma indicated that even though the time interval between injury and presentation of treatment was important in the prognosis for neurological recovery, the spinal cord had a lot of capacity to adjust to the compromised state of compression.

32. Non-surgical treatment with ultrasound therapy, epidural administration of methylprednisolone acetate and supplementation of vitamin B complex was found to be reasonably effective for the treatment of traumatic paraplegia due to intervertebral disc disease.

33. Modified spinal stapling and tension band wiring could be performed with the basic orthopaedic instruments and the implants used were inexpensive.

In conclusion, surgical treatment of dogs with traumatic paraplegia by modified spinal stapling and tension band wiring was simple and could be performed with minimum surgical facilities.

Spinal fixation with hemilaminectomy showed better results as compared to spinal fixation without hemilaminectomy or medical treatment. However, more studies are desirable in spinal fixation for traumatic posterior paralysis in dogs using various other surgical treatment procedures like bone plating, pins and screws with polymethylmethacrylate and external skeletal fixation.