Available Online at http://www.journalajst.com

ASIAN JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN: 0976-3376

Asian Journal of Science and Technology
Vol. 11, Issue, 11, pp.11358-11359, November, 2020

RESEARCH ARTICLE

NOVEL TECHNIQUES IN MAKING A DOG SKELETON

Sivagnanam, S.* and Paramasivan, S.

Department of Veterinary Anatomy, Veterinary College and Research Institute (TANUVAS), Orathanadu-614625

ARTICLE INFO

Article History:
Received 17th August, 2020
Received in revised form
09th September, 2020
Accepted 18th October, 2020
Published online 30th November, 2020

Key words:
Skeleton, Dog, Novel, Assembling, Bones and Technique.

ABSTRACT

Skeletons are three dimensional specimens useful in teaching and learning process. Dog skeletons prepared in a neat and legible manner will be a better teaching aid and museum exhibit. In this research novel techniques were introduced in different stages of preparation of the dog skeleton. These novel techniques will make significant contribution for museum curators, Veterinary Anatomists, Surgeons, Clinicians and Practitioners towards understanding of the subject. As on date there was high rise in the number of teaching institutions which creates a high demand for skeletons. Simple, fast and effective assembling process of dog skeleton was found to be the need of the hour.

Citation: ***Sivagnanam, S. and Paramasivan, S.*** **2020.** "Novel techniques in making a dog skeleton", *Asian Journal of Science and Technology*, 11, 11, 11358-11359.

INTRODUCTION

Skeletons make good teaching aids for students as well as better museum specimens [Gofur, 2010]. Many institutes lack a neat and legible mounted skeletons. Current syllabus emphasis on cadaver donation for preparing teaching aids for students. Anatomically correct mounted dog skeleton is of great significance for Institutes as well as veterinary practitioners, surgeons and experts in radiology [Baker *et al.*, 2003]. A radiograph is a two dimentional image but a skeleton make three dimentional specimen for better understanding [Gadre, 2007]. Anatomically correct skeleton could only be made by the subject specialist and not by a non teaching faculty. Transition of techniques of making dog skeleton from traditional method to novel techniques was carried out while preparing consecutive four numbers of dog skeletons. Also the novel procedure was documented by photographs and videos for teaching the upcoming anatomists to learn the new method of mounting the dog skeleton.

MATERIALS AND METHODS

A nine year old non descript dog cadaver was received from a donor during 2019 in the department of Veterinary Anatomy, Veterinary College and Research Institute, Orathanadu. The skin and visceral organs were immediately removed.

***Corresponding author: Sivagnanam, S.,**
Department of Veterinary Anatomy, Veterinary College and Research Institute (TANUVAS), Orathanadu-614625.

Excess muscle and fat were also removed and the remains were put into the maceration tank. A mixture of beneficial bacterial species available commercially (250 gm of Bactizyme) was mixed in the water poured into the maceration tank. After a period of 15 days the bones were carefully collected and soaked in lime water for two days followed by brush cleaning of the bones and the resulting clean bones were sun dried. Bones were arranged in Anatomical organization. The carpals and tarsals were attached using epoxy resins. Wiring was done between long bones. Metacarpals and phalanges were also arranged and attached using epoxy resins. Tin copper wire of 300 gm was used for binding the bones at their joints. A stainless steel rod of appropriate thickness was bent at head and neck curvatures was used to support the vertebral column and head. The stage and pillars were made in wood (Fig. 2) according to the size of the skeleton. The pillar height should be sufficient enough to give the normal angles in the joints of forelimb and hindlimb.

Articulations of forelimb bones: Dual holes were made in the distal extremity of scapula and proximal extremity of humerus and 'U' type wiring was done to give strength to the binding joint. Between humerus and radius a 'O' type wiring was done with single hole in each bone. In addition radius was bound to ulna by a twisted wiring. Assembled carpal was bound to radius and ulna by epoxy resin. A 'O' type wiring overlapped carpal joint between the radius and metacarpal bones. During wiring care was taken to preserve the angle of bones during normal posture of the animal.

Articulations of axial skeleton: Mandible was bound by drilling and wiring between the condyle of mandible and temporal bone. Another wiring between the body of the mandible and premaxilla. Occipital condyles were pierced and wired on both sides. The wires were left long enough to run a long pleating type of wiring between the orderly arranged vertebrae through the natural foramina so as to complete the assembling of vertebral column inclusive of coccygeal vertebrae where drill holes may be required. Thereby no holes were drilled in the binding process of vertebrae. Tubercular facets of the ribs and thoracic vertebrae were wired by 'O' type wiring. The heads of the ribs were bound into the capitular cavities by rubber adhesives. The sternum was connected by binding wires between sternum and distal extremity of first eight ribs. In addition the space between each rib (intercostals space) was maintained by double wire pleating (Fig. 1), which offered additional strength to rib cage.

Figure 1

Figure 2

Articulations of hindlimb bones: Os coxae was bound to sacrum through single wire and rubber adhesives applied in the articular faces so as to permit limited movement in that joint. Head of the femur and acetabulum were bound with 'U' type wiring with femur facing forward and downward. Tibia and femur were wired through double 'U' type wiring. Patella was fixed to trochlea in femur through a single 'U' type wiring. Rubber adhesives were used to join tarsals with tibia and fibula. Fibula was also attached to tibia via rubber adhesives. Double 'O' type wirings were made to bind the tibia and metatarsals overlapping the tarsal joints. Pes was prepared by epoxy resin binding the bones in appropriate positions.

RESULTS AND DISCUSSION

The resulting dog skeleton appeared much aesthetic. The angulations in the joints were quite natural. The joints were firm and sturdy. The procedure of assembling the dog skeleton included some new materials and methods. Epoxy resins and rubber adhesives were used for binding small bones. Certain species of anaerobic bacteria were used for quick maceration to avoid the use of hazardous chemicals. These bacteria were harmless to live human and that they act only on the dead tissue. Before collection of bones the bacteria along with the slurry of tissue were removed with running water. Soaking in lime water rendered the b ones free from tissue debris. Hence this method of assembling was found to be simple, fast and effective.

REFERENCES

Baker, P., Davis, S., Payne, S. and M. Revill. 2003. On preparing animal skeletons - a simple and effective method. International Council for Archaeozoology, Newsletter vol. 4 (1): 4&15.

Gadre, K. M. 2007. Quick method of preparation for animal and bird skeleton. *Indian Journal of Animal Sciences.* 77(3): 245- 246.

Gofur, M. R. and Khan, M. S. 2010. Development of a Quick, Economic and Efficient Method for Preparation of Skeleton of Small Animals and Birds, *Int. J. BioRes.* 2 (7): 13-17

****