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RESEARCH ARTICLE

ORGAN PRESERVATION BY PLASTINATION TECHNIQUE: A NOVEL TOOL FOR TEACHING.

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Abstract

Use of Formalin fixed samples as a teaching tool is less effective in creating interest among student towards anatomy as these samples are not easy to handle as well as create nausea. Plastinated gross anatomical samples are popular among students as they are easy to handle, odourless, nonhazardous and stable. Preserved specimens are long lasting so require less number of cadavers. Plastination is a process of tissue preservation by embedding tissues with synthetic materials to produce dry, durable, handy and natural looking specimens useful as a unique tool for teaching of anatomy, pathology, radiology and surgery. The 10% formalin fixed and preserved specimens of goat heart, brain and kidney were subjected to dehydration, impregnation and hardening with clearing, dehydrating and curing agents. Tissue fluids and lipids were removed with a dehydrating agent and replaced with polymer under force impregnation. Prepared samples are odourless and easy to handle.

Introduction:-

Preservation of specimens by saturation with a formalin based solution as open, wet preparations or by enclosure in glass or Perspex pots not create interest among students however it is unpleasant to work with it due to formalin vapour emitted. Use of formalin also creates health hazards associated which limits the usefulness of this type of preparations. Plastination techniques were developed in the 60s' (Singh *et al*., 2013). Plastination is used in hundreds of laboratories worldwide to help with the teaching and study of the body. Plastination is useful in anatomy as well as serving as models and teaching tools (Timothy *et al.*, 1990). In the present study plastination of goat brain, kidney and heart was done to create specimen which can be handle easily and procure for longer duration. It also avoid killing of animals in the name of science, due to the fact that plastination process allows specimens to last a long time (Menaka *et al*., 2010).

Materials and methods:-

The specimens of heart, brain and kidney were collected from the local meat shop of Rewa district (M.P., India). These specimens were preserved in the 10% formalin for one month period. Subsequently, 2-3 changes were given at 3 days interval in acetone for dehydration. The clearing and impregnation was done with 1:1 ratio of chloroform and melamyne solution for 4-5 days. Then, 2 changes were given in same ratio of solution at 3 days interval. Further, specimens of heart, brain and kidney were subjected to the curing process by soaking in 9:1 ratio of melamyne and hardner for 4 days. Finally they were air dried without exposing to direct sunlight (Menaka and Chaurasia, 2015).

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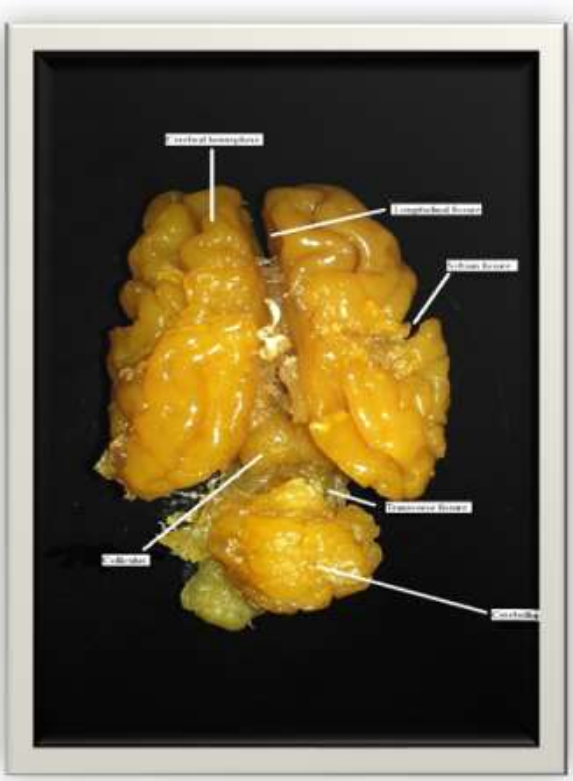

Fig.1: Plastinated specimen of Dorsal view of Goat Brain

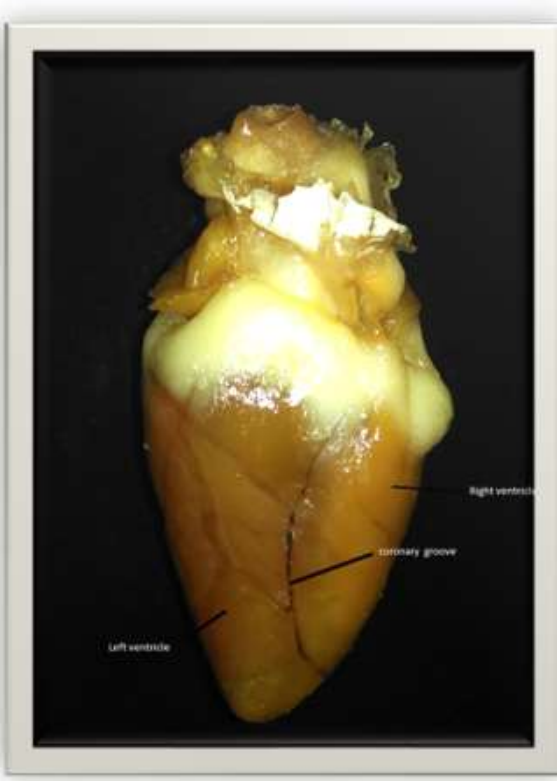

Fig.2. Plastinated specimen of Goat Heart

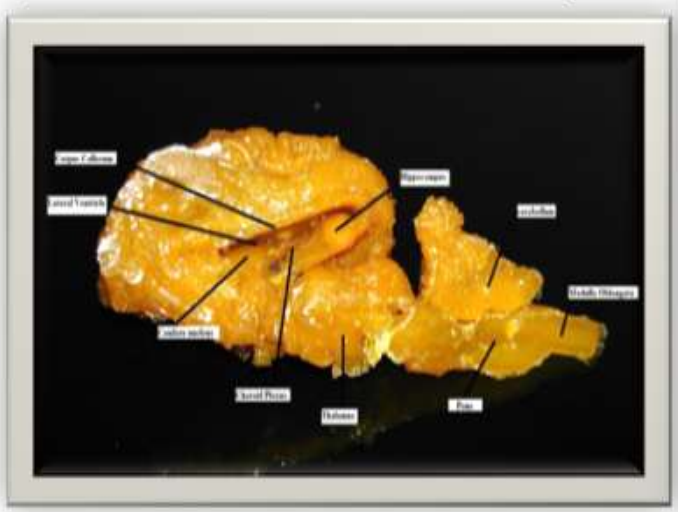

Fig.3: Plastinatedspecimen of sagittal section of Goat Brain

Fig.4: Plastinated sample of Goat Kidney

Results and discussion:-

This technique allowed preservation of specimens by dehydration and impregnation with plastic material that is melamyne wood paint. Specimens prepared with plastination were glossy in appearance and resembled to its natural look. These specimens were easier to handle and pleasant to touch for demonstration of heart, dorsal , ventral , sagittal view of brain, gross appearance of kidney and section of kidney of goat (fig. 1-4). These specimens can be

effectively utilized and preserved in eco-friendly conditions. In fig.1, in dorsal view of brain longitudinal fissure, transverse fissure, sylvian fissure, cerebral hemisphere and cerebellum were observed. In sagittal plane of brain, thalamus, hippocampus, colliculi, pons, medulla and cerebellum were clearly identified and easily explainable to the students (fig.3). It reflected that after plastination detail of organs was not lost resemble with the findings of Menaka and Chaurasia (2015). Gross specimen of heart explained the details of coronary grooves and chambers distribution. The exterior and interior of kidney was well explained. Through this technique the biological life on our planet can be preserved as per the need of the students and course curriculum avoiding the noxious contact with formalin.

Conclusion:-

Specimens prepared with melamyne and hardener was low cost and can be store for longer duration without any extra efforts as requirement of formalin tank or specimen jars. These specimens also created interest among students as they are easy to handle. They also prevent from hazardous effects of formaldehyde and make fume free environment for study in anatomy laboratory. This particular approach may be very valuable in Veterinary Colleges and medical colleges where teaching aids/models are restricted by various ethical concerns. Over past recent study shows development of plastination has opened up new dimensions for gross anatomy teaching and organs preservation area (Menaka and Chaurasia, 2015).

Acknowledgement:-

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