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THE POLYURETHRANE FOAM AS A METHOD FOR THE PRESERVATION OF THE ANATOMICAL ORGANS

ALAA A.SAWAD*
AL-ASADI,F.S**
J.SHEREEN***

*Dept. of Anatomy, College of Veterinary Medicine, University of Basra, Basra, Iraq
**Dept. of Anatomy, College of Veterinary Medicine, University of Basra, Basra, Iraq
***Dept. of Anatomy, College of Veterinary Medicine, University of Basra, Basra, Iraq

ABSTRACT

Traditional approaches, Veterinary resources and other health science students may use animals and their organs as a model for learning anatomy, there are numerous methods to study anatomy: the anatomical organs must be preserved for a long time for teaching. In this study, we use a special method for the stomach of dog and sheep and lungs of sheep, in which they were dried and injected with spray foam. The results show that the injected organs do not show any anatomical changes, which indicate that the foam is one of the best methods for the preservation of anatomical organs.

KEYWORDS: Preserving Organs, Plastination, the Foam

INTRODUCTION

The anatomical organs must be preserved for long time for teaching. Several methods used in this purpose. The formalin is a good solution for body preservation was introduced in 1896 to help with the body preservation (viskasari. *et. al*, 2012). Paraffin impregnation was introduced in 1925 and the embedding of organs in plastic was developed in 1960 (church, 2014). In November 1979, Gun von Hager applied for a German patent, proposing the idea of preserving animals and vegetable tissue permanently by synthetic resin impregnation (Tiedemann, and vonhagens, 1982). This technique which is described here enables specimen to expanded organs by foam spray, which is a chemical product materials that bubble and expand up to 280 times its liquid volume after sprayed, this expansion makes it especially useful as packing material which forms the shape of the product (David France, 2003).

MATERIALS AND METHODS

The compartment stomach and lung of a sheep were collected from the local Basra slaughterhouse. The simple stomach of the dogs were collected immediately from post Mortem animals. The organs were washed with tap water; the surrounded tissues were

removed closed to the organ carefully in order not to damage the wall. It is recommended to soak the organ in ethyl alcohol to dehydrate the tissues and extract some of the lipids,. The organs were injected with expanding foam (Aristo, Guangdong, China). If too much loss of foam occurs via the exhaust, it can decrease in size or closed. The next day, more foam may be injected through one opening to fill an area that prevent foam to reach complete filling of the organ. The organs, then were coated with some plastic varnish stretch (Jotun Woodsheild, Johor, Malaysia). Finally, the holes can be done in different sections to allow for viewing the internal structures.

RESULTS

The foam spray expanded 5-6 time in volume in all directions. All organs became dry, hard to touch, the time needed to hardening is two days in all organs selected for this study. We have not found any deterioration of specimens; no color change and no fungal growth. Also, we have no found any gross morphological changes were observed in the organs, in addition to the light weight organs. The above observation was noticed four months after foam injection. The varnished specimens had the best appearance in cleaning and air dry. (fig1, 2,3,4,5,6)

DISCUSSION

The polyurethane foam method should be focused on the use of projected specimens to develop anatomical techniques depending on the low financial resources and by using few simple devices, we have tried to preserve the organs using non expensive and locally available chemicals like urethane foam. This method is very quick and cheap for producing dry specimens for teaching, and the dissected organs can be prepared in two days in comparison with frozen dried specimen which take between 5-6 days (Stewart, 1990) or plastinated specimens which take between 4-6months (Von Hagens, 1985) (Sullivan and Mitchell, 1995). The polyurethane protects the inside of organs from insect damage while the application of varnish does the same for the external surface (Arnautovic et al., 2005). The foam also protects the organ from collapsing under normal handling. Various techniques has been used to make organs resistant to insect damage, including fiber glass (Kitchel et al, 1961), flexible plastic resin (Updike and Hoaday, 1986) and silicon (Henry and Butler, 1990). The foam was found to be ideal in this study, which is for the first time in Iraq as it is reported by (Arnautovic et al, 2005) in the canine stomach specimens in USA

Fig (1) parietal view of dog stomach

Fig (2) visceral view of dog stomach

Fig (3) visceral view of sheep's stomach

Fig (4) parietal view of sheep's stomach

Fig (5) sheep stomach showing the sac of the rumen

Fig (6) sheep lung (costal and mediastinal surface)

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