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

ASIAN JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN: 0976-3376

Asian Journal of Science and Technology
Vol. 5, Issue 3, pp. 181-182, March, 2014

RESEARCH ARTICLE

THE EPOXY RESIN PLASTINATION OF REPRODUCTIVE ORGANS OF ANIMALS

***Sivagnanam, S., Balasundaram, K., Selvaraju, M., Ravikumar, K., Kumaravel, A. and Paramasivan, S.**

Department of Veterinary Anatomy and Histology, Veterinary College and Research Institute, Namakkal-2

ARTICLE INFO

Article History:
Received 06th December, 2013
Received in revised form
21st January, 2014
Accepted 07th February, 2014
Published online 25th March, 2014

Key words:
Plastination,
Gynaecological specimens,
Epoxy resins

ABSTRACT

Plastinated specimens make significant and quick references for the understanding of Gross Anatomy. The reproductive organs were collected from the slaughter house in Namakkal, Tamil Nadu and are fixed in Keiser ling I solution. Dehydration was done by a number of changes in acetone followed by xylene. The air drying of the specimen in the following step permits substitution of xylene by air. The organs are treated with epoxy resin followed by curing with a mixture of resin and catalyst. The completely cured specimens are labeled and the labels are again coated with resin catalyst mixture, so as to make the labels permanent. Thus, the resulting specimens become a three dimensional model of original which do not require wet preservation.

INTRODUCTION

The Epoxy resin plastination is a procedure where the fluids in the body are replaced by reactive polymers such as epoxy resins. Plastinated specimens are dry and odorless they retain their natural surface and are identical with their state prior to preservation. Since plastination using silicone resin is very expensive, the epoxy resin, commercially available in the name "Araldite" is used to plastinate reproductive organs of different domestic animals. This indigenous plastination process is cheaper and resulted in good quality dry, odourless and solid specimens which can be used for teaching Gynaecology. The class of polymer used determines the mechanical and optical properties of the preserved specimen (Hagens et. al., 1987). Plastination technology has obtained great acceptance, particularly because of the high quality of the preservation as well as the durability and the teaching value of the specimens.

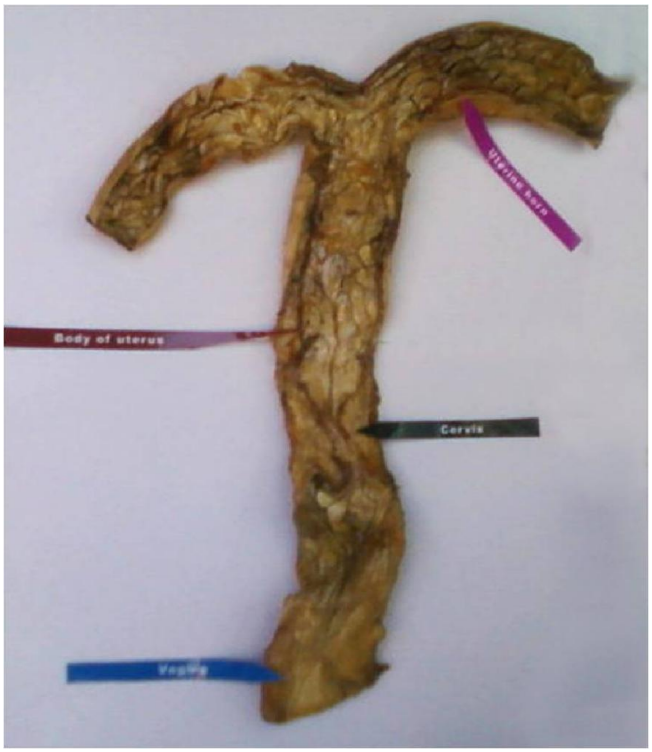
MATERIALS AND METHODS

The Indigenous plastination technique was conducted on male and female reproductive organs of various domestic animals. The specimen are collected from slaughter house in Namakkal. The specimens are initially fixed using Keiserling I solution that contain formalin, potassium acetate and potassium nitrate for five consecutive days. After proper fixation the specimens are thoroughly washed in tap water for six hours. Then the specimens are dehydrated in acetone for three weeks. Every week the specimens are removed from old acetone and placed in fresh acetone in order to ensure maximum liquid dehydration. Then the specimens are placed in xylene (Tiedemann K, 1987) till they become transluscent. Later the specimen are completely air dried followed by coating with epoxy resin catalyst mixture at the ratio of 9:1. Curing is complete by hanging the specimens undisturbed in air at room temperature for fifteen days.

RESULTS AND DISCUSSION

After plastination, the resulting tissue is safe to handle (i.e., toxic fixatives are eliminated), the tissue has no odour and it is extremely durable (Hagens et al., 1987). Keiserling solution is found to be the best fixative for plastination process (Oostrom 1987) because it maintains the original colour of the organ. This method involves three phases. In the first phase, acetone replaces bodily fluids and fat through diffusion. In the second phase, the acetone is replaced with xylene. In the third phase, xylene is replaced by atmospheric air by which step the specimen becomes light weighted and dry. Henry (1992) used "BIODUR" S-10 curable polyester resin for plastination. Since such special quality resins are not available in India, this study was conducted by using indigenous epoxy resin and catalyst which are less expensive. The dehydrated and defatted specimen was coated thrice with epoxy resin catalyst mixture at the ratio of 9:1. The coating with resin catalyst mixture was done every consecutive day for three days. Since the said ratio of resin catalyst mixture takes nearly fifteen days to cure in air,

Corresponding author: Sivagnanam, S.,
Department of Veterinary Anatomy and Histology, Veterinary College and Research Institute, Namakkal-2



EPOXY PLASTINATE OF A MARE UTERUS

the resin can get through the tissue to a depth of one millimeter, resulting in hard surfaced, light weighted specimens that are little lesser in size than their natural state. According to Hagens *et al*., (1987) the silicone resin impregnated specimen is hardened by exposing it to a gaseous hardener and polyester or epoxy resin impregnated specimen is hardened by exposing it to light and heat. In this study the specimens were cured with atmospheric air, which completed the curing process by fifteen days. Plastination is carried out in many institutions worldwide and has obtained great acceptance particularly because of the durability, the possibility for direct comparison to CT- and MR-images. Plastinated specimens can be repeatedly handled by students without causing any body reactions of chemicals (Ramakrishna *et al*., 2002) and can be stored as would any inert object.

Conclusions

This study has established the fact that we can produce indigenous plastinates of cheaper cost which are highly durable and user friendly, requires no wet preservation and can be best used for teaching gross anatomy.

REFERENCES

Hagens, G.V., Tiedemann, K and Kriz W. 1987. The current potential of plastination, Anat Embryol (Berl); 175(4):411-21.

Henry, R. 1992. Proceedings of the VIth International Conference on plastination held at Ontario, Canada 26th – 31st july.

Oostrom, K. 1987. Fixation of tissue for plastination, General principles, *Journal of International Society for Plastination*, 1:3.

Ramakrishna, V., Gadre, K.M., Pawar, A. and Dhoolappa, M 2002. Plastination – a viable alternative of preserving the biological specimens, *Indian Veterinary journal*; 79; 1158-1159.

Tiedemann, K. 1987. Tools for the infiltration of dehydrated specimens with silicone rubber, *Journal of International Society for Plastination*, 1:2.

****