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Fireproof plastinates

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Abstract

Plastination is a method that has grown in popularity over time, used for the preparation of educational and exhibition samples. We have created many and various anatomical samples to be used in the education of our students in the plastination laboratory we have established since 2010. In this article, it is aimed to explain how our 10-year plastination collection was affected by the fire that broke out in our laboratory building in June 2020 and to bring this information to the literature.

Keywords: anatomy; education; fire; plastination

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Plastination has been developed and diversified with numerous studies published over the years since the first introduction of Von Hagens' technique.[1,2] In recent years, studies that reveal the importance and value of plastination, especially with its contribution to health sciences education, come to the fore.[3–7] With real tissue-based samples prepared with the plastination method, students are provided to learn anatomy in hygienic and safe environments, especially at the undergraduate level. Plastination also made it possible to enrich educational materials by creating samples dissected at different stages, coloring important structures, or cross-section samples prepared in different thicknesses from different planes.[8–12] In addition to these, resistance to physical factors (such as ultraviolet or impact), no need for special storage conditions, and long-term usage of the plastinates provide economic use and sustainability of cadavers, which can be difficult to obtain in some countries.[13]

In our department, we have been using plastinates, which we have produced with various techniques since 2010, together with embalmed samples in our students' practical anatomy lessons. While we prefer silicone plastination (Biodur Products GmbH, Germany) especially for preparing three-dimensional samples (such as dissected upper and lower extremities, thorax and cranium), we also prepare cross-sectioned samples with epoxy (Biodur Products GmbH, Germany) and polyester (Poliya, Turkey) techniques. However, with the technique we have developed, we can also produce silicone plastinates from serial sectioned (2–10 mm) materials (such as sagittal foot, sagittal knee joint flexed, coronal hand and head sections).[14,15] We archive the prepared samples by giving code numbers and store (also exhibit) them in glass-door cabinets at the entrance of the anatomy laboratory. These plastinates are used during the relevant practical lessons and students' positive feedbacks are received.

Unfortunately, most of our macroscopy laboratory was damaged in an unfortunate fire on June 15, 2020. This fire broke out in the entrance of the laboratory and affected the cabinets where the plastinates were stored. The cabinets were partially burned, and the glasses on the cabinet doors exploded and partially melted due to the heat (**Figure 1a**). According to the information received from the fire department, the temperature in the area where the cabinets are located has exceeded 700°C degrees. When we checked the condition of the plastinates inside the cabinets after the quenching and cooling processes, it was found that the plastic bases were completely melted, but surprisingly the plastinates did not suffer any damage. It was seen that the surfaces of the plastinates were coated with adhesive black soot (**Figure 1b**). All the plastinates in the cabinets were removed, the adhesive soot was cleaned twice in warm dishwashing water with a toothbrush and sponge, and the samples were rinsed and placed on blotting papers to dry (**Figures 1c** and **d**).

It has been observed that even after being exposed to extreme heat, covered with soot, and washed with deter-

gent water, the plastinates are preserved as on the first day and are not adversely affected by the whole process. Our entire collection is saved and usable.

Highly visual anatomical structures obtained by performing detailed and laborious dissections unfortunately lose these properties in long-term formalin fixation. Thanks to plastination, the first-day characteristics of the detailed structures shown by dissections are preserved and educational materials that can be easily worked with bare hands and used in the same way for many years can be created. In addition, exposure to the negative effects of formalin such as bad odor, skin and mucosal irritation and other

Figure 1. (**a**) The damage done by fire. (**b**) Sectional head specimens completely coated with adhesive soot. (**c**) Cleaning the adhesive soot in warm dishwashing water with sponge, the remaining soot (**white arrow heads**) was then cleaned with the help of a toothbrush. (**d**) Rinsed and dried samples are ready for use.

toxic effects during practical lessons are also eliminated.[3–5,7] It has been shown that not only fresh specimens, but also old formalin-fixed cadavers and organs can be plastinated, and that existing educational materials can be used in a healthier and longer time.[13]

Today, plastination is carried out in many countries in medical and veterinary faculties and by some private companies.[2,5] In our country, however, only a few plastination is done in the laboratories of a few faculties with limited facilities. Some universities are imported plastinated samples in limited numbers and at high costs to be used in anatomy lessons. The durability, resistance to physical factors, easy storage conditions, and long-term usage are well known properties of plastinated specimens. This article also deals with their resistance to fire and high temperatures and their ability to be cleaned with detergents.

We think that with the widespread production and use of plastinated materials in education in our country, the cadaver problem experienced in medical faculties will be solved to a certain extent, and the quality of education will be increased with appropriate educational materials and a positive contribution will be made to the economy.

In our literature search, we did not find a study containing direct information about the heat resistance of plastinates. Therefore, we think that the experience we gained as a result of a misfortune is important and should be shared.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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