

Study of Central and Peripheral Hemodynamics in the Corpse Perfusion Model

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Introduction

Several cadaveric fixation methods are used to keep human bodies preserved in the best possible way. According Healy et al (1), the formaldehyde is the oldest and most effective and still the most widely used method of embalming, which allow the preservation of macroscopic and microscopic features. However, the International Agency for Research on Cancer (2) has been proven the high carcinogenic potential, due this the embalming has been of the best alternative in conservation of corpses (3-4). Thus, nowadays the embalming method of excellence, which preserves all features, while keeping the disinfectant properties against the cadaveric decomposition process, is proposed by João Goyri O'Neill et al (5). Their method is referred by Brenner's (6) and Balta's et al. (4) like the most modern and efficient technique in cadaveric preservation.

Thus, the aim of this study is to analyze the quality of embalming in cadaveric perfusion, at the organ level, based on central and peripheral hemodynamics.

Methods

All the material here presented results from corpses fully legalized donations. All them were embalmed by Goyri O'Neill's et al (5) technique keeping flexibility and fresh appearance for several years. In present study was used five aortic arches of corpses which period of embalming was between one and three years with several causes of death. To obtain these arches was necessary to dissect the rib cage. After histological slides were made to analyze features of the wall them, which they were chords with hematoxylin and eosin (HE) and Veroeff techniques.

All corpses were embalmed with pulsed automatic arterial perfusion system (Figure 1), which allows the injection control of embalming fluids with a frequency of 1 Hertz, beyond to seek the stability of all vascular network, as well as the measurement of parameters inherent to vascular perfusion, such as flow and pressure.

Figure 1. Perfusion apparatus



Results

The corpses analyzed here showed preserved skin color, mobility and texture (Figure 2), as can be confirmed in the literature (4-6). However, regarding organs, the preservation of their morphological characteristics are preserved, ensuring a similarity with the living individual.



Figure 2. Cadaveric perfusion a few time after death

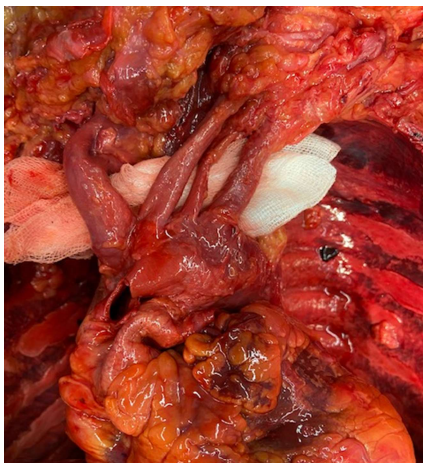


Figure 3. Exposure of aortic arch.

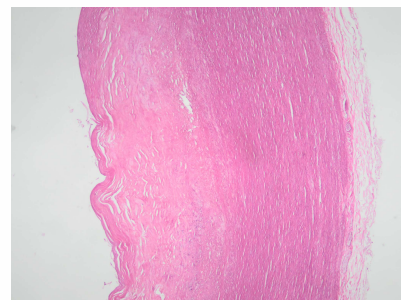


Figure 4. Histological section of the aortic arch with HE.

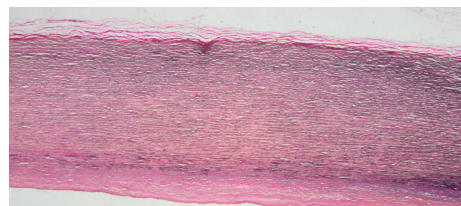


Figure 5. Histological section of the aortic arch with Veroeff.

After obtaining the arches, it was possible to observe that their macroscopic and microscopic characteristics remain preserved, even after a few years of embalming, regardless of the cause of death (Figures 3, 4 and 5).

Conclusions and Perspectives

Previous conclusion about our study demonstrated that Goyri O'Neill's et al (5) Technique answered question propose by Balta et al (4) according preservation of organs. Our continuous study will intend to show new informations about preservations of human organs with that embalming. It is important to promote classes more comfortable, surgical training, search and development new surgical techniques, and improve them, due this liquide don't have any smell like another one to preservation corpses. In addition it allows a close proximity of the expected practice during a surgical procedure, since it retains features found alive. Furthermore, until now it was possible to see that microscopic analyze presented positive to preservation of structures feature of vessels, like aorta.

In our future studies will analyze another vessels, their structures, microscopy view, geometry and hemodynamics.

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