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Microbial Growth on Soft Embalmed Cadavers Over Time

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Abstract

Objectives

At their inception, cadaveric anatomical studies were performed without embalming of any kind. Over time, physicians correlated rates of infection and death with cadaveric exposure and cross contamination. Formaldehyde solutions are now the most familiar and widely used embalming formulas. While formaldehyde embalming provides preservation and disinfection, it also makes cadavers stiff, unpliable and a less efficacious option for surgical training. Fresh cadavers can provide an alternative, however without some sort of preservation these cadavers quickly putrefy and pose an infectious risk. To address this problem, soft embalming techniques have been developed for anatomical and surgical studies. As soft embalming techniques have grown in popularity, the solutions and methods have diversified, and a wide variety of soft embalming solutions are being used. Soft embalmed cadavers are often used over extended periods of time in educational environments making them potential sites for microbial colonization and infectious exposure. While there are many studies evaluating the educational utility of soft embalmed cadavers, there are very few studies monitoring their long-term antimicrobial efficacy. The objectives of this study are twofold:

- 1.Examine the long-term antimicrobial capacity of a Surgical Reality Fluid, one of the many soft embalming solutions available.
- 1.Quantify and identify any microorganisms found in order to evaluate for potential infectious risk and possible need for more thorough safety measures when working with such soft embalmed cadavers.

Methods

Prior to embalming, a sterile swab was used to sample the oral, nasal, rectal, inguinal, pedal, and axillary regions of 4 donated bodies. The samples were then plated on the following agars: blood, EMB, CNA columbia, nutrient, and sabouraud. The agar plates were then incubated at 37 C for 4–7 days. All unique colonies were gram stained in an attempt to identify each colony. PCR was used to quantify bacterial load. The first sampling was completed preembalming and served as a baseline for each cadaver. After embalming, repeat sampling took place every 2 months for 6 months.

Results

Growth was identified prior to embalming. As data was continually collected, cadavers were monitored for the presence of persisting bacteria or re-colonization over time. Any bacteria present was compared against what was present prior to embalming, what would be expected with a typical non-embalmed necrobiome, and possible cross contamination during educational activities.

Conclusions

This is the first study to monitor bacterial growth over time on cadavers embalmed with Surgical Reality Fluid. The conclusions of this study serve to elucidate if further safety measures or regulation of embalming techniques are needed for soft embalmed cadavers in an educational setting.

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