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Tracheal cartilage cryopreservation

Avelina Sotres Vega, J Villalba Caloca, M Gaxiola Gaxiola, S Martinez Fonseca and A Santibanez Salgado
National Institute of Respiratory Diseases, Mexico

Currently, there are no surgical strategies to treat tracheal lesions longer than 7 cm. Such patients are not candidates for tracheal resection or end-to-end anastomosis and are thus left with only repeated palliative procedures to relieve their respiratory insufficiency. Experimental studies using cryopreserved trachea have produced contradictory results, limiting the clinical application of this technique. We evaluated the histological integrity of canine tracheal cartilage cryopreserved using two different solutions, two temperatures, and varying lengths of storage time. 30 canine tracheal segments of 5 rings were studied. Group-1: Control without cryopreservation. Group-2 and 4: Cryopreserved in F12K media with 20% fetal bovine serum (FBS) at -70 °C for 48 hours. Group-3 and 5: Cryopreserved in 90% FBS at -70 °C for 48 hours. Group-4 and 5 were then stored for 15 days in liquid nitrogen (-196 °C). All of the segments were thawed, fixed in wax and cut into rings. Three rings were selected for histological evaluation. Staining of cartilage matrices was significantly modified in the tracheal segments of Group-5. The central region of the cartilage ring was more vulnerable to the effects of freezing than the edges. Under the same cryopreservation temperature and storage time, tracheal cartilage integrity is better preserved when F12K media is used.

Biography

Avelina Sotres Vega is a Chemist Biologist with Master's degree in Physiological Sciences and PhD in Biological Sciences from National Researcher of the Science and Technology Council of Mexico (CONACYT). She is a Full Professor and Researcher at National Institute of Respiratory Diseases "Ismael Cosío Villegas", Mexico, since 1988. She has expertise in cryopreserved tracheal grafts in experimental models of long segment replacement as well as teaching and learning programs on surgery using preserved biomaterials either by cryopreservation or lyophilization.

avelinasotres@gmail.com

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