

Alcor A-2758

Case Report



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1. Overview

This case report discusses the events surrounding a case arranged post-mortem by a third party for a woman in her 80s who arrested in December 2013 without cryopreservation arrangements. Her son first had her body embalmed, then had the brain extracted and stored in fixative, while the rest of the remains were cremated. Standard concentrations of formalin were used; however, we have no details on the actual fixation process. Funding was raised through the Society for Venturism to have this case accepted by Alcor and she became a patient in July 2014. A lengthy process of slow cryoprotection of the brain was conducted, at low, above-freezing temperature, and the patient then was cooled and entered liquid nitrogen storage in November 2015.

2. Personnel

Mike Perry, Ph.D., Care Services Manager; Jerry Searcy, Alcor Volunteer; Hugh Hixon, Alcor Facility Engineer.

3. Timeline of Events

On September 20, 2013 Mike Perry received a call from Ron Putirka, 69, a former Alcor member (A-1334) living with his mother in Las Vegas, NV. As background: Mr. Putirka's dog Benje (P-008) was cryopreserved at Alcor in May 1991 (Riverside, CA) and is still in storage. Later, Mr. Putirka had to cancel his own arrangements for financial reasons. The call was not about his arrangements but mainly concerned his mother, Elizabeth Pugliese. Mrs. Pugliese was 88 years old with debility due to advanced age. She had previously signed paperwork authorizing her son to cryopreserve her remains according to his own discretion but had no cryonics arrangements in place, either with Alcor or another cryonics organization.

Mrs. Pugliese's condition worsened over the next 2½ months and became terminal with thoracic and abdominal aneurysm, according to the death certificate. She arrested early Friday morning, December 6. The son promptly had the body transported to nearby Palm Mortuary in Las Vegas and put under refrigeration. (Refrigeration started perhaps two or three hours postmortem.) On Monday, December 9 the body was perfused (embalmed) with formalin fixative, at ambient room temperature with "special attention to the brain," using the carotids for perfusion access. (The supervising mortician reported there was no clotting observed during the operation.) The son had wanted whole-body cryogenic storage but in view of the cost decided to opt for brain-only preservation. On Saturday, January 11, 2014 the brain was extracted and placed in a formalin fixative bath by a pathologist who also worked in a nearby area and had permission to store human remains. The brain was taken to the ME's Office and stored there pending further arrangements by the son; however, the storage temperature is unknown. (The mortician and the pathologist, whose names are withheld, are especially to be thanked and commended for their assistance in this case.)

A fundraising campaign was conducted by the Society for Venturism to pay for the long-term care costs of Mrs Pugliese's brain, and was successfully concluded by the following summer. Mrs. Pugliese was tentatively accepted as an Alcor patient and then fully accepted by Dr. Max More, Alcor's CEO, after consultation with the Venturist Society. Finalization of the arrangements occurred when the necessary paperwork was completed, allowing the patient to be transported to Alcor's facility.

On July 14, 2014 Alcor Membership Administrator Diane Cremeens prepared a third-party contract for Ron Putirka to sign and have notarized, a "Last Will and Testament for Human Remains and Authorization of Anatomical Donation." Jerry Searcy and I left Alcor, Scottsdale, Arizona for Las Vegas about 9 a.m. and arrived at Ron Putirka's home about 3 p.m. We found a notary service and the paperwork was signed and notarized, transferring custody of Mrs. Pugliese's remains to Alcor Foundation. Jerry and I spent the night at the "Underground House," in Las Vegas, a facility generously made available for our cryonics-related cause by the Society

for the Preservation of Near-Extinct Species, and generously hosted by its two then-occupants, Mark Voelker and Brenda Peters.

Jerry and Mike left Las Vegas about 8:30 the following morning, arriving at the Medical Examiner's Office, in Lake Havasu City, Arizona, a little before noon. The ME officials were very friendly and cooperative and had no problem with Alcor's paperwork or with taking possession of the patient. An initial stop was made at a nearby Circle-K to obtain four 40-lb bags of ice as thermal protection. The patient's brain, stored in a Tupperware tub with taped-on lid was being stored at a cool but unknown temperature. For the trip back to Alcor the container with patient was placed in an insulated cooler, surrounded on all sides by bagged ice, with a little free ice to fill any gaps. The trip back to Scottsdale was uneventful, with arrival about 5:30 p.m. Periodically during the trip, the Alcor personnel pulled off the road to check that there was sufficient ice, and that it hadn't melted. The patient's brain, still in the Tupperware container, was then transferred to refrigerated storage (approximately 3° C) and cryoprotective diffusion was started by Hugh Hixon using progressively increasing concentrations of glycerol in fixative up to a final glycerol concentration of 10 Molar as detailed in the appended table.

4. Long-term care

The cryoprotection of the patient was completed in November 2015, and the patient was transferred to a neurocan along with another brain-only case, A-2699. Cooldown to LN2 temperature, which started November 6, was routine and was completed November 11. The two patients in their neurocan were then placed in long-term cryogenic care.

5. Diffusion cryoprotection table

Diffusion cryoprotection steps worksheet											Alcor #	A2758
step ->	0	1	2	3	4	5	6	7	8	9	10	11
conc -->	0	0.30	0.45	0.68	1.01	1.52	2.28	3.42	5.13	7.69	10.00	10
to add -->		72.00	37.11	56.54	86.86	135.19	214.89	354.03	622.93	1261.93	2400.00	2400
added-->		50	40	60	87	136	215	354	623	1000	2400	2400
date added -->	21-Jul-2014	11-Sep-2014	22-Sep-2014	30-Jan-2015	4-Feb-2015	16-Feb-2015	3-Mar-2015	17-Mar-2015	26-Mar-2015	17-Jun-2015	28-Aug-2015	
Initial step												stir
1% formaldehyde	65 ml 37% aq soln						C(conc) = 10M					6-Oct-15
2% glutaraldehyde	192 ml 25% aq soln						$10M \cdot V(\text{add}) + (2400 - V(\text{add})) \cdot C(\text{prev}) = 2400C$					15-Oct-15
0.5mM Ca++	1.76 ml 10% CaCl ₂ 2H ₂ O soln						$10M \cdot V(\text{add}) + 2400C(\text{prev}) - V(\text{add})C(\text{prev}) = 2400C$					2-Nov-15
5mM Mg++	12.2 ml 20% MgCl ₂ 6H ₂ O soln						$(10M - C(\text{prev}))V(\text{add}) + 2400C(\text{prev}) = 2400C$					6-Nov-15
Na ₂ HPO ₄	11.93 g Na ₂ HPO ₄						$(10M - C(\text{prev}))V(\text{add}) = 2400C - 2400C(\text{prev})$					into LN2
KCl	8.9 g KCl						$V(\text{add}) = 2400(C - C(\text{prev})) / (10M - C(\text{prev}))$					11-Nov-15
make pH to 8.0 w/NaOH	make to 2400 ml w/water						$V(\text{add}) = 2400 \cdot (C3 - B3) / (10M - B3)$					
water molarity is roughly 55M												
Final glycerol step (make 4 times)												
Na ₂ HPO ₄	11.93 g Na ₂ HPO ₄	in 250 ml										
KCl	8.9 g KCl											
1% formaldehyde	65 ml 37% aq soln											
2% glutaraldehyde	192 ml 25% aq soln											
10M glycerol	1884 ml AR glycerol	1/2 + 1/2, pH to 7.8 - 8.0 w/NaOH										
0.5mM Ca++	1.76 ml 10% CaCl ₂ 2H ₂ O soln											
5mM Mg++	12.2 ml 20% MgCl ₂ 6H ₂ O soln						Note					
make pH to 8.0 w/NaOH	make to 2400 ml w/water											
water molarity is roughly 10M												

--End of report--