THE PREOPERATIVE PRESERVATION OF AMPUTATED DIGITS: AN ASSESSMENT OF PROPOSED METHODS


BACKGROUND: Cooling of an amputated digit to a temperature of 4°C has been recommended to reduce ischemic damage and prolong the window for successful replantation to up to 24 hours.

METHODS: These Australian authors evaluated six methods of cooling in a study of chicken feet trimmed to approximate the size of a human finger. After insertion of a digital thermometer, the specimens were wrapped in two layers of sterile gauze soaked in normal saline and then placed in a plastic specimen jar or a sealable plastic specimen bag. The jar or bag was then placed in a separate specimen bag containing 300mg of ice cubes and 200ml of tap water which was placed in an empty plastic kidney dish (bag-in-bag and jar-in-bag), directly into a plastic kidney dish containing 300mg of ice and 200ml of tap water (bag-in-dish and jar-in-dish), or into a lidded plastic denture cup containing 80mg of ice cubes and 60ml of tap water (bag-in-cup and jar-in-cup). Serial temperature measurements were determined with each scenario on two separate days (72 total samples and 2,771 individual measurements).

RESULTS: The jar-in-bag method achieved the most favorable combination of results. With this method, the target temperature (2-6°C) was achieved reasonably quickly (mean 31.7 minutes vs. 26.7 minutes with the bag-in-bag method and 32.5-58 minutes with the other methods) and maintained the target temperature for the longest time (225.8 minutes vs. 33.3-139 minutes with the other techniques) with few occasions of excessive hypothermia. The worst performance was noted with the bag-in-dish method (target temperature achieved in 58 minutes and maintained for 62 minutes). Mean tissue temperatures were invariably above target when ice was no longer visible.

CONCLUSIONS: These findings support the jar-in-bag method for preservation of amputated digits prior to replantation. 14 references (anna.holdgate@sswhs.nsw.gov.au for reprints)

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