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Soner Tatlıdede
Emre Gonen

Semra H. Karsıdag
Sisli Etfal Training and Research Hospital,
Department of Plastic and Reconstructive Surgery,
Sisli-Istanbul, Turkey
E-mail address: emregonen76@yahoo.com

Ismail Kuran
Maltepe University,
Department of Plastic and Reconstructive Surgery,
Maltepe-Istanbul, Turkey

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Perceptions of correct preoperative storage and transfer of amputated digits: a national survey of referring emergency departments

The increasing ability of plastic surgeons to perform hand, trauma and microsurgery has increased both patients' and doctors' expectations of what we can achieve. This has resulted in a multitude of ever smaller body parts in a range of conditions appearing in front of the on-call plastic surgery team for consideration of replantation. With technical advances in surgery there is a possibility that the medical community may have overlooked the more simple issue of how a replantable digit should be prepared, stored and transported. In recent years, our unit has received digits potentially suitable for replantation, which have been stored and transported inappropriately, in some cases rendering the tissue unviable.

To assess the perception among referring practitioners of how amputated digits should be packaged and transported to the Welsh Centre for Burns and Plastic Surgery, we performed a telephonic survey of all emergency departments in Wales ($n = 18$) in September 2007. A semi-structured questionnaire consisting of two parts was used. Part A consisted of an open-ended question while part B had a structured approach. The best practice adopted for storage and transport of amputated extremities was that stated in the Advanced Trauma Life Support for Students (ATLS).¹

- Step 1 Wrap in moist gauze
- Step 2 Wrap in towel
- Step 3 Put in a plastic bag
- Step 4 All placed in another plastic bag with ice or ice + water.

In addition to this, it was also observed how many respondents would label the part with the patient's details in line with the UK Tissue Authority Requirements.

Questionnaire

Section A - Open question

A patient walks into your emergency department with a completely severed finger.

How would you prepare and pack the digit before transferring it to another unit for replantation?

Section B – Structured questions

- Qu 1 Can a finger be stored directly on ice?
- Qu 2 Can a finger be stored in sealed sterile saline?
- Qu 3 Do you trim and clean the amputated part?
- Qu 4 If yes with what would you clean it with?
- Qu 5 How long is a correctly stored digit viable?
- NB Record any other storage methods mentioned

From a total of 72 individuals invited, 50 respondents (70% response rate) were recruited (four were consultants, 20 were specialist registrars and 26 were senior house officer level). Twenty respondents opted not to answer and being too busy. Only 9/50 (18%) respondents described the procedure (steps 1–4) sequentially and correctly, excluding labelling of package. Only 3/50 would routinely attach an ID tag with patient information in line with the Human Tissue Authority Requirements.² Twenty-one out of 50 (42%) respondents believed that the amputated digit could be stored directly on ice, and 16 (32%) thought that it could simply be stored in sterile saline. Nineteen doctors (38%) said they would routinely trim and clean the amputated part, using a variety of solutions [saline (7), chlorhexidine in water (4), iodine (aqueous) (1), iodine (alcohol) (5) and heparin in saline (2)]. The emergency doctors in general were unsure of the safe cold ischaemia time for amputated digits (μ 3.42 h: range 1–24 h).

Many publications over the years have discussed the correct storage and transport of amputated digits and indications for replantation, including a recent meta-analysis of success rates following digital replantation.³ Despite published ATLS guideline for the storage and transfer of potentially replantable digits, our unit has increasingly been exposed to incorrectly prepared and stored body parts. This in itself is worrying, as the ATLS course is a pre-requisite for surgical training in the UK and promoted by accident and emergency departments. From our national study, it is clear that a minority of referring practitioners know how body parts should be safely transported. A small number of worrying storage methods were put forward from qualified

medical staff including: placing the amputated part in a glass and freezing it, putting it in a pot of formalin, covering with a simple jelonet wrap and wrapping in paper bag and placing in a cool box. It is of note that such surprising responses have been noted in a previous UK study.⁴

Although the limitations on inference from a small descriptive study are recognised, our results clearly highlight the misperceptions of referring medical practitioners, the onus on plastic surgeons to educate and advise referring emergency departments, and not to presume that the amputated parts will be stored and transferred correctly. With the increasing 'turn over' of casualty officers in the new NHS training pathways, the need for experienced plastic surgeons to educate junior trainees and supervise referrals has never been so acute.

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Ernest A. Azzopardi
Iain Stuart Whitaker
Hamish Laing

Welsh Centre for Burns and Plastic Surgery, Morriston
Hospital, Swansea, UK

E-mail address: iainwhitaker@fastmail.fm

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The routine sampling of internal mammary nodes as part of breast reconstruction

Dear Sir,

Sentinel lymph node studies have shown that internal mammary nodes (IMNs) can be involved in 10–15% of breast

cancer patients, and 16–20% of these are positive.^{1,2} Many patients avoid biopsy because of the invasive nature of sampling these nodes. However, the involvement of these nodes not only gives important prognostic information but also can alter the management offered to the patient.

In a subset of breast cancer patients undergoing autologous breast reconstruction with the deep inferior epigastric artery perforator (DIEP), transverse rectus abdominis myocutaneous (TRAM) or gluteal flap, sampling these nodes is possible whilst preparing the internal mammary recipient vessels for anastomosis. Indeed, Arnez et al.³ sampled 11 consecutive DIEP reconstructions and found one chain to be positive for tumour. In another series at Sloane Kettering Cancer Center, where IMN is routinely biopsied, Mehrara found positive chains in almost 3% of patients.⁴ In all of these cases, irradiation was added to the management of cancer.

In the UK, sampling of IMN at the time of breast reconstruction (either delayed or immediate) is not a routine procedure unless thought to be clinically suspicious. Following several unexpected positive results, we now routinely consent and biopsy IMN in all our patients undergoing autologous breast reconstruction. We also advocate this policy to the readers.

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Faisal Salim
Babak Mehrara
Afshin Mosahebi

Plastic and Reconstructive Surgery, The Royal Free
Hospital, Pond Street, London NW3 2QG, UK
E-mail address: ms983734@doctors.org.uk

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