

## Concern with the use of electrodes in perforator marking

Sir,

We read with great interest the recent article, 'A simple technique of marking the perforator of a free flap for post-operative monitoring'<sup>[1]</sup> published in your reputable journal. The authors have demonstrated a reproducible alternative to conventional methods for marking perforator vessels and boast a decrease in caution calls due to doubts about the vascular status over the past 3 years.<sup>[1]</sup> However, it would also be interesting to know the resulting rate of nosocomial infections in this period.

Use of electrocardiogram (ECG) electrodes may provide a moist site for colonisation of Gram-negative bacteria. This can be true for both reusable and single-use ECG electrodes.<sup>[2,3]</sup> I would like to direct your attention to a case study involving a patient who underwent cardiac bypass surgery. In the immediate post-operative period, the patient developed tachycardia, pyrexia and hypotension. Post-operative blood cultures detected Gram-negative *Bacilli*. In the absence of clinical or bacteriological evidence of a primary infection, further investigations confirmed that the culprit was ECG electrodes contaminated with *Klebsiella*. Further investigations of such electrodes showed potential for contamination with both *Pseudomonas* and *Klebsiella* strains.<sup>[3]</sup>

Trend *et al.*<sup>[4]</sup> have suggested the role electrode gel plays in protecting microorganism environment. It noted that Venkatramani *et al.* have applied electrodes during the period where flap failure risk is the highest resulting in

regular monitoring of flap viability.<sup>[1]</sup> We speculate that the hands-on clinical monitoring and use of gelled Doppler probes could increase the potential for contamination of ECG electrodes and harbouring of bacteria.

Compared to conventional methods, the author describes this method as 'better' because there is no need to worry about loss of site due to erased markings. However, in practice, electrodes can lose adhesive strength secondary to movement, scratching or moisture. Although bad practice, it is not uncommon for single-use electrodes to be reused as a cost-saving measure. Daley *et al.* have demonstrated the cross-infection potential for reused single-use electrodes harbouring skin flora or potential pathogens.<sup>[2]</sup> Thus, it must be questioned whether inappropriate use of electrodes in a plastics ward or proximity of healing wounds is a viable option.

Since the case previously described, there have been advances in disposable electrodes and most of the current literature compares disposable to reusable electrodes. Despite showing the clear benefit of disposable ECG leads over their reusable counterpart, there is a lack of concrete evidence, suggesting disposable ECG electrodes are not a site for pathogens. In an era where patient safety and infection control are emphasised, it would seem detrimental to both patient and multidisciplinary team to introduce an unnecessary potential site for pathogen manifestation in the immediate post-operative period.

Although the authors have demonstrated an interesting alternative to conventional marking methods, the lack of research into the infection potential of disposable electrodes post-operatively makes it unclear whether they pose a risk or not to flap survival. In light of the caveats described above, the infection potential of such a method should not be underestimated. Thus, it is suggested that until further studies bring clarity to the conundrum, conventional marking methods remain superior to ECG electrode placement in marking perforator vessels unless appropriate infection prevention methods are in place.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

**Tarak Agrebi Mounni Chouari,  
Michalis Koullouros**

The Suttie Centre for Teaching and Learning in Healthcare,  
School of Medicine, University of Aberdeen, Scotland,  
United Kingdom

**Address for correspondence:**

Mr. Tarak Agrebi Moumni Chouari, The Suttie Centre for Teaching  
and Learning in Healthcare, School of Medicine, University of  
Aberdeen, Scotland, United Kingdom.  
E-mail: tarak.chouari.11@aberdeen.ac.uk

## REFERENCES

1. Venkatramani H, Hosahalli G, Sabapathy SR. A simple technique of marking the perforator of a free flap for postoperative monitoring. *Indian J Plast Surg* 2015;48:321-2.
2. Daley AJ, Hennessy D, Cullinan J, Thorpe S, Alexander R. Letter to the editor: Potential microorganism transmission from the re-use of 3M Red Dot adhesive electrocardiograph electrodes. *J Hosp Infect* 2005;61:264-73.
3. Lockey E, Parker J, Casewell MW. Contamination of E.C.G. electrode pads with *Klebsiella* and *Pseudomonas* species. *Br Med J* 1973;2:400-1.
4. Trend V, Hale AD, Elliott TS. Are ECG Welsh cup electrodes effectively cleaned? *J Hosp Infect* 1989;14:325-31.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

### Access this article online

Quick Response Code:



Website:

[www.ijps.org](http://www.ijps.org)

DOI:

10.4103/0970-0358.182249

**How to cite this article:** Chouari TA, Koullouros M. Concern with the use of electrodes in perforator marking. *Indian J Plast Surg* 2016;49:130-1.