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The cost per quality-adjusted life year (QALY) gained by RM is low as demonstrated in our study. It is not essentially affected by the costs of preoperative screening or histological examinations. But is radiological and pathological screening in RM populations cost effective in order to find and treat occult breast cancer? It is a complex question to answer because possible benefits (QALYs and economic savings) are challenging to estimate. Nevertheless when defining cost-utility, both cost and benefit should be taken into account.

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Value of the implantable doppler system in free flap monitoring

Dear Sir,

Clinical tests to monitor free flaps, such as inspection of colour, capillary refill and handheld Doppler, are still judged by many as the 'gold' standard.¹ However, there are clear indications that other monitoring methods available today can detect a compromised blood flow earlier compared to these conventional methods and are easier in use as well. The search for an optimal monitoring method therefore continues.

The implantable Doppler system (Cook Medical®, Cook Ireland Ltd, Limerick, Ireland) has proven itself in the monitoring of buried flaps, but the advantages it offers

could also make it of value as a standard monitoring device.² In earlier studies we retrospectively investigated the reliability of the system, as well as the effect it had on the success rate of revised flaps.^{3,4} Although it proved reliable, questions remained whether it could improve the salvage rate compared to conventional monitoring methods. Furthermore, there were signs that the implantable Doppler system was easier to interpret than conventional monitoring methods, therefore making it easier to use for nursing and medical staff.

To investigate both these topics, a prospective study was started in which flaps were either monitored with conventional monitoring methods or by the implantable Doppler system. The implantable Doppler system was used for venous monitoring and not arterial, as previous research by Swartz et al.⁵ had shown that probes placed around the vein detect venous occlusion immediately and arterial occlusion after 6 +/- 2.4 min. Probes placed around the artery detect an arterial occlusion immediately, but venous occlusion after 220 +/- 40 min. The current study was performed at the Department of Plastic Surgery of the University Medical Center Groningen, Groningen, The Netherlands, at which both monitoring methods had been previously used. The study initially started as a pilot. Based on the outcome of the pilot a power analyses would be performed to verify the required number of cases to draw a conclusion on the possible beneficial effects of the implantable Doppler.

The study had to be stopped in an early phase because of problems with the implantable Doppler system. In one case the silicone cuff of the system caused venous congestion of the flap by kinking the vein. In two cases the Doppler crystal attached to the silicone cuff did not release while retracting the wire. In these cases the wire released from the crystal, leaving the crystal behind. In another case the implantable Doppler system did not function after application. The error was observed directly after application and as no obvious explanation could be found, it was decided to exclude this case from further analysis. The protocol dictated that the study had to be stopped in case of four adverse events.

During the time the study ran, we were able to include 19 patients undergoing 23 free flap reconstructions. In the implantable Doppler group, three flaps were scored as compromised by our nursing staff. Two of these scores turned out to be false positives after clinical inspection of the flap by a senior resident. The third case, an anterior lateral thigh flap was compromised and taken back to theatre, where a successful revision took place. In the conventional monitoring group two cases (both deep inferior epigastric perforator flaps) were scored as compromised. Both cases were taken back to theatre. One case was successfully revised, in the other case flow was re-achieved during the initial revision. The flap became, however, compromised again and eventually failed despite a second salvage procedure.

With regard to the ease of use of the monitoring methods, the implantable Doppler system was judged to be more difficult to interpret compared to the conventional monitoring methods. One of the reasons for this is that the audible signal, that is heard when there is flow across the anastomosis, can differ per flap.

In summary, despite the limited number of cases in this study, conventional monitoring methods are still judged by us as superior over the implantable Doppler system as a standard monitoring device. The main reasons for this are the adverse effects we experienced and the additional costs of the implantable Doppler system. In buried flaps, flaps that are difficult to monitor with conventional methods or other selected cases the implantable Doppler system probably has an advantage over conventional monitoring methods.

Disclosure

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Challenges in obtaining aesthetic breast ideals: Reply to 'Concepts in aesthetic breast dimensions - Analysis of the ideal breast'

We read with interest this paper defining the ideal breast dimensions as a 45:55 ratio of upper to lower pole proportions.¹ Whilst we commend the authors for attempting to tackle such a difficult problem we are however unsure if the proposed methodology is suitable or sound.

One of our principal concerns is a point that the authors partially refer to in that the photographs analysed are not standardised. The models are typically posing with arched backs, retracted shoulders with variable arm positions, presumably to accentuate breast projection. Comparison between such images with clinical photographs is not possible with any degree of accuracy^{2,3} especially as images in journals are themselves easily misinterpreted.⁴ For example, differences in positioning of the camera can change the apparent relationship between the nipple and inframammary fold.

The "ideal ratio" relies on accurate assessment of the precise point where the breast takes off from the chest wall from any one individual photograph or indeed of the same photograph between different raters. It is a notable exclusion from the paper that it does not state who or how many people performed the image analysis. To address this point we took a random sample of 6 images from the paper (assigned Figures A–F) from which we digitally removed the line marking the extent of the upper pole, printed at high resolution, enlarged to A5 size and showed to 10 consultant plastic surgeons that regularly perform aesthetic breast surgery. The consultants were asked to draw on the image an arrow at the point of breast take off as described in the paper. Individual measurements (to the nearest 1 mm) were recorded of the distance between the marked nipple meridians and the breast take off points. These measurements were analysed to assess the inter-rater variability of landmark placement and the subsequent effect that differing measurements would have upon the calculated upper pole ratio (see Table 1).

As can be seen there is marked variation between consultants on the placement of the breast take off point which significantly impacts upon the calculated ratio. With this much variability between raters and the technical difficulty defining the inframammary fold in ptotic breasts, we find it unlikely that the authors calculated methodology can be used to determine breast aesthetics from photographs. It is worthy of note that the variances were greater amongst our raters when the "ideal" results were re-measured. This means that the true ideal ratio may well