Editorial Commentary

Establishing a new head and neck microvascular reconstructive service

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Microvascular reconstruction after head and neck cancer resection was first described in the early 1980s (1) and has been the unquestionable standard in head and neck reconstruction for over 30 years with reported success rates of 95–100% (2-6) in some units internationally. In established surgical reconstructive units, compromised reconstruction with regional pedicled flaps is now considered below the minimum standard expected and reserved for salvage after failed free flap reconstruction or in severely medically compromised patients where prolonged anaesthesia is contraindicated. The need to establish a new microvascular service in the absence of any existing service is therefore rare. Where this situation exists and head and neck surgery is being undertaken without formal reconstruction, there will likely be enthusiasm and support for establishment of a microvascular reconstructive service to support the existing head and neck cancer service.

The important factors to consider when planning to establish a new microvascular service are:

(I) Training and experience: setting up an independent microvascular practice should not be undertaken without the appropriate level of training and technical ability. When appointed to a well-resourced maxillofacial unit where there is an established microvascular service, senior consultant support and mentorship can be titrated to the new surgeon's progress. The newly appointed surgeon can hone their reconstructive surgical skills in a protected environment buffered from potential criticism. The level of competence and confidence required for this form of appointment is incomparable with that required to set up a new independent practice. For the solo microvascular surgeon establishing a new practice, all complications and take backs could potentially be scrutinised. The surgeon must be sufficiently trained to operate with potentially inexperienced assistance. They must have sufficient experience to trouble shoot any potential setbacks or complications independently. At a minimum, the level of training will likely be focused higher surgical training followed by fellowship training or a proven track record in a previous consultant post.

(II) Appropriate funding: although shown to be cost effective in terms of greater function (6) and quality of life (7), free flap reconstruction is more expensive than locoregional flap reconstruction. A microvascular service cannot be developed on a cost neutral basis and this needs to be appreciated by hospital management. For example, a maxillectomy and neck dissection can be finished by lunchtime and the patient transferred back to the surgical ward with a temporary obturator or dressing pack *in situ*. Where free tissue reconstruction especially bony reconstruction is undertaken, the surgery will often not be finished within 'normal' theatre session hours, necessitating theatre staff overtime (two teams) and the patient may then require transfer to a high dependency or even intensive therapy facility postoperatively. A significant upfront investment for equipment including operating microscope and microvascular instruments (duplicate as a minimum in case of take back), is required. The ideal situation is where the driver for the establishment

of the microvascular service is the ablative head and neck surgeons coupled with recruited support from the clinical director for surgery. The newly appointed surgeon with microvascular training and head and neck specific expertise can be presented to the hospital management as the solution to an acknowledged deficit in service. This is much more likely to be successful than the reconstructive surgeon lobbying the hospital management for investment independently and trying to persuade them of a service need. Although requiring additional financial outlay, virtual surgical planning reduces theatre time (8) and has been shown to be cost effective (9). It should be considered to be the standard of care rather than a luxury item and accepted by hospital management as the cost of providing this service.

(III) Surgical and anaesthetic support: although possible, establishing a single handed head and neck cancer practice with both ablation and reconstruction is to take on a huge burden both physically and psychologically. It may be preferable to team up with another surgeon (usually either maxillofacial or otorhinolaryngology) and this is now the norm in the UK (10). It is important that your collaborating colleague appreciates how their surgery affects the reconstruction. An ablative surgeon who gives the junior trainee a free hand at the neck dissection for 4 hours meaning that the flap inset and subsequent microvascular surgery is delayed until late afternoon or early evening is not doing the reconstructive surgeon any favours. Similarly, the ablative surgeon must be relied on to leave a dry surgical field with preservation of important structures (including recipient vessels), where possible. Spending an hour drying the surgical field after the ablative surgeon has left the theatre could lead to frustration and resentment within the surgical team.

Anaesthetic factors have a direct influence on free flap success (11) and it is important to cultivate a good working relationship with the anaesthetist. Head and neck cases frequently run over normal operating session hours so there will need to be agreement about early starts or late finishes. Involvement of the clinical director may be required to agree some form of compensation (either payment or time in lieu). Good working relationships in the operating theatre are important for all surgery, but are even more vital where the operations are long, complex and multi stage. High staff turnover increases stress levels and should be avoided.

Advanced planning is required when setting up a new microvascular service. The reconstructive surgeon would do well to make careful notes before finishing up in their previous position (e.g., fellowship unit). In an established unit, the theatre team will have set up protocols for instruments, patient positioning and microscope settings, refined over many years. It is unlikely that the trainee surgeon will ever have had to advise the theatre team, for example about dilution of heparin saline or papaverine solutions. It may be helpful to provide the senior scrub nurse with laminated cards well in advance of the first microvascular case. Similarly, the anaesthetist may appreciate a discussion about specific requirements for the case (e.g., target mean arterial pressure or the need to turn the patient to the lateral position). The complexity of every procedure is amplified in a theatre setting where there is a lack of experience in supporting microvascular reconstruction. The reconstructive surgeon should avail of every opportunity to streamline the process.

In some cases, a head and neck reconstructive service may already be being provided reluctantly by surgeons whose primary appointment is to provide other subspecialist services such as breast reconstruction or hand surgery. Despite the lack of enthusiasm for head and neck reconstruction, the newly appointed surgeon with overt ambition to undertake microvascular reconstruction is unlikely to be welcomed warmly and the situation needs to be handled sensitively to avoid an open "turf war". A general interest in head and neck cancer surgery (possibly even initially employing the existing microvascular services) can then gradually be expanded to include free flap reconstruction. This can be framed as an expansion of head and neck services rather than a takeover of the service by one specialty over another.

Despite the fact that microvascular reconstruction is often viewed as an enigma, it is simply a surgical technique. Predictable success rates are possible by approaching it systematically and controlling as many of the variables as possible.

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