**The site**

Professor Fu-Chan Wei and his department have been leaders in the field and pioneers microvascular surgical techniques for over thirty years. The department has experience of over 17,500 free flaps and is one of the largest in the world. They have pioneered, published on and perform a number of techniques that are rarely practiced in OMFS in the UK.

Chang Gung hospitals are a network of privately owned facilities in Taiwan. Linkou hospital, Taipei is the largest in the network and where I was based for a 2 week clinical attachment. Linkou hospital has 4000 in-patient beds, 67 adult theatres and 33 paediatric theatres. The adult theatre suite manages around 600 surgical procedures per day. The hospital manages 10,000 out-patient appointments per day.

**Comparison with the UK**

The scale and scope of the department is like nothing in the UK. Several free flaps are performed daily (I was able to observe over 15 head and neck free flap cases in 2 weeks). The department also provides a microsurgery service for other specialties. A total of 50 free flaps were performed across all body sites during my visit.

Practice varied considerably compared to the UK. Most notably, resections and neck dissections were performed by ENT or, in the case of benign disease of the jaws, singly qualified oral surgeons. The plastic surgery department provided the reconstructive service.

**Patient factors and pathway**

The most striking difference with UK practice was the very late stage disease being treated. Almost every case I observed was T4a or T4b with extensive disease requiring composite resection of intra-oral tissues, bone and skin. Many cases involved resection of both maxilla and mandible. It is unusual to see patients in the UK with such advanced disease but without distant metastatic spread. These complex cases may be concentrated in Chang Gung due to it being a tertiary referral centre. It may also be related to betel nut chewing as an aetiological factor, and cancer behaving differently than our UK cohort.

Thromboembolism is rare in this population. No prophylactic anticoagulation is given pre or post operatively. Conventional radiotherapy is provided as they do not currently have access to IMRT.

**Specific learning outcomes;**

**Medial Sural Artery Perforator Flap (MSAP)**

Chang Gung has been at the forefront of research and development of this flap and has considerably more experience than any UK unit. The MSAP has a reputation for being technique sensitive and is associated with a learning curve.

Interestingly, they now rarely use this flap. They found the donor site scarring to be unacceptable. The ALT flap is thinner in the Asian population than in Caucasians and so is a viable alternative. The main learning points they raised were;

The perforator often runs a subcutaneous course for a substantial distance so the initial incision should be very defensive.

They feel that in a number of the cases where no suitable perforator is found, that the perforator may have been damaged in the initial incision.

An endoscope can be helpful in identifying the location of perforators.

**Flaps in irradiated sites**

The department has significant experience of using free flaps in previously irradiated sites and has published a large series with 94% flap survival.

Learning points;

They tend not to use composite flaps in ORN cases, preferring soft tissue only reconstructions and accepting discontinuity of the mandible. They have preference for ALT flaps in this instance.

When faced with placing a flap in a hostile tissue environment, they try to de-epithelialise the flap and fold it, so the de-epithelialised aspect is in contact with the unfavourable tissue. This serves to protect the perforator and pedicle.

**Free style flaps**

Professor Wei and his colleagues have been pioneers in the use of free style perforator flaps, a technique rarely performed in the UK. This technique has the potential to further reduce morbidity compared to our standard ‘armamentarium’ of free flaps and offer better matching of tissue thickness, type and texture.

In reality, the technique is usually only used if a suitable perforator cannot be found in the normal locations, or if this perforator is damaged during dissection.

**Fibula flap**

Prof Wei has published extensively on the vascularity of skin in fibula flaps. His technique for harvest is different from many published sources and I believe makes the flap more useful. The septum is used as an anatomic guide to the location of the perforators only. Once perforators are identified, the septum is incised allowing greater freedom of movement of the skin paddle from the bone. No cuff of soleus or gastrocnemius muscle is taken. Again, they have maintained excellent flap survival with this technique. Very large skin paddles were routinely raised this way.

**ALT**

All ALTs are raised in the supra-fascial plane. They suggests that the when raised in the sub facial plane it is not possible to determine if the perforator adequately perfuses the skin or ends in the fascia. They also feel preserving fascia minimises donor site morbidity. Compared to the UK population, ALTs are thinner. They frequently raise ALTs with vastus laterlis muscle to add bulk. They prefer this to rectus abdominus flaps as the skin paddle has more freedom of movement and they feel the donor site morbidity is minimal.

**Microvascular anastomosis**

Trainees in the team rotate around other microvascular sub-specialties in Chang-Gung. Another area they have particular expertise is super-microsurgery. While the main application of this is lymphoedema surgery, the techniques involved can have benefits in the general microvascular surgeons ‘toolbox’. They are willing to perform anastomosis with very small vessels and have maintained excellent flap survival. They have also used super-micro couplers to repair damaged perforators. These skills can be very useful in difficult cases or when free-style perforator flaps are being utilised.

**General points**

Approach to reconstruction.

When faced with very large composite defects, the team often opted for soft tissue only flaps with reconstruction plates. The rational for this was that these patients have a poor survival and so as simple as possible a reconstruction is preferred. Those that survive in the longer term are considered for composite free flap reconstruction as a second procedure. Plate exposure is a commonly seen complication after radiotherapy.

**Deformity surgery**

I was lucky to be in Taiwan when the unit hosted the ‘Plastic Surgeons of Chinese Origin’ conference. As the department effectively shut down for 2 days for this, I attended it. The craniofacial team presented an update on their thoughts on orthognathic surgery. The unit performs around 600 bimaxillary osteotomies a year. There were clear differences with UK practice. They have now almost universally gone to surgery first operating and report shortened total treatment times with good outcomes. They also occasionally use Invisalign for post surgery orthodontics and report good outcomes. They frequently perform bimaxillary retrusion surgery and report that good outcomes can be obtained if a genioplasty is performed at the same time. This procedure is rarely performed in the UK and this may reflect racial difference between the populations. They frequently augment orthognathics with microfat transfer 6 months after surgery to improve contour irregularities or asymmetries.

**Benefits of the trip**

My 2 weeks in Chang Gung exposed me to a large number of free flaps in a short period of time. The size and nature of defects I saw are rarely encountered in UK practice. As detailed above I have taken away a number of learning points that I will take forward in my career in head and neck oncology. I would like to thank BAOMS for their support.