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The plastic & reconstructive Mohs surgery service



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Summary Mohs Micrographic Surgery (MMS) is the current 'gold-standard' for excision of a number of cutaneous lesions and provides a valuable addition to a skin cancer service. The Mersey Regional Centre for Mohs Surgery is the first MMS service in the UK to be led by an MMS trained Plastic and Reconstructive surgeon, and this article describes an overview of the processes involved in establishing such a service.

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Background

Mohs Micrographic Surgery (MMS) is a technique combining excision of skin tumours with maximum potential for local tissue conservation. Microscopy is used to examine the entire margin of excised lesions at the time of surgery, and an intraoperative mapping method is used to accurately record residual lesion, hence the term 'micro-graphic'. Any remaining tumour is subsequently resected in stages until completely excised and reconstruction of the defect can then be performed with confidence of tumour-free margins.

MMS is usually reserved for a subgroup of basal cell carcinomas (BCCs) (Table 1), and other non-melanoma skin cancers (NMSCs) such as squamous cell carcinomas (SCCs), dermatofibrosarcoma protuberans (DFSP), microcystic adnexal carcinomas (MACs), atypical fibroxanthomas (AFXs), and lentigo malignas.

The UK has adopted MMS since its introduction in the early 1980s¹ and it now forms part of the British Association of Dermatologists' guidance for the management of BCCs² and SCCs.³ In addition, the National Institute for Health and Clinical Excellence (NICE) recommends that each skin cancer network site-specific group (NSSG) should provide MMS.⁴ Globally, dermatologists traditionally deliver MMS, with referral to plastic surgery or other appropriate speciality if complex reconstruction is required.

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Table 1 Guideline indications for MMS in BCC.²

Guideline Indications for MMS in BCC

Tumour site (especially central face, around the eyes, nose, lips and ears)
Tumour size >2 cm
Histological subtype (especially morphoeic, infiltrative, micronodular and basosquamous subtypes)
Poor clinical definition of tumour margins
Recurrent or incompletely excised lesions
Perineural or perivascular involvement

and Reconstructive surgeon, and we describe an overview of the process to establish such a service.

Setting up a Mohs suite

In order to maximise the safety and efficiency of a Mohs service, the Mohs suite should be planned with thought and consideration. Several aspects should be addressed such as room design, correct equipment choice, and appropriate staff selection and training.

Mohs patients often spend several hours in the suite, and as such consideration should be given to the waiting and recovery areas. In particular this should be in close proximity to the nurses' station, have provision of food and drinks, some reading material and/or music or television, and have patient locker facilities available.⁵ Patients should be allowed to change into theatre gowns in privacy, and, in our unit, patient recovery areas are single-sex.

The Mohs theatre should be located near to the recovery room and have regularly serviced and maintained equipment including a standard daycase operating table, operating lights, hand washing and scrub facilities, electrocautery, suction and emergency equipment, including an oxygen supply. Other features such as flooring and ceiling material and airflow should meet requirements for daycase theatre operation.

The Mohs laboratory should be as close, and ideally adjacent, to the theatre as possible. Laboratory grade flooring, ceiling and workbench materials are required, and planning and co-ordination of the Mohs laboratory equipment is paramount in optimising accurate preparation of specimens and their analysis. The laboratory should be designed in a logical, ergonomic manner to permit efficient specimen processing. The workbench area should have a cutting block for specimen division and coloured inks to mark specimens for mapping. In our unit a Cryobloc for freezing the tissue is located adjacent to the cutting/marking station. The Cryobloc was designed by Motley⁶ and is a short tower attached to a liquid nitrogen source. We prefer this popular method of freezing, as it allows rapid and precise preparation of frozen specimens by the surgeon. A number of other techniques are available, including use of the 'freeze bar' within the cryostat machine.⁷

A cryostat machine is used by the basic medical scientist (BMS) to section the frozen specimens for subsequent staining. Automated specimen staining equipment should ideally be available to stain the slides, and a downdraft table should be in place to eradicate fumes from the staining chemicals. These chemicals must be stored in accordance

with the manufacturers' guidance, including use of a fire-proof storage cabinet, and a first-aid kit must be available and include eyewash. In addition to the basic precautions, the lab should have a file of operating protocols to enable consistent specimen preparation and provide guidance in case of an incident such as a chemical spill.

A separate microscopy viewing area should ideally consist of a microscope with dual heads for training purposes.⁸ In our unit, the microscope is also attached to an external monitor to allow viewing by multiple persons. Whilst many Mohs surgeons will examine their histology slides alone, both the Mohs surgeon and a consultant pathologist review all slides in our unit. This is in keeping with around 34% (10/29) of Mohs units in the UK,⁹ and allows for an 'instant second opinion' which in turn maximises patient safety, and obviates any need for patient delays in the event of second opinions being required from otherwise remotely-sited pathologists. We have also found that this maximises the opportunities for trainees to gain in-depth basic and advanced training in histological interpretation and techniques.

The final station in the laboratory has a computer with an internet connection, a scanner/printer, and a telephone. These facilities allow access to electronic patient records, completion of an electronic Mohs patient database, and scanning and copying of MMS maps.

Current costs for laboratory equipment are approximately £40,000, which may increase according to brand, specification, and surgeon preferences. Whilst the design of a laboratory may seem daunting for the new Mohs surgeon, close liaison with the pathology management team can greatly facilitate the process and, in our opinion, is essential.

The Mohs micrographic surgery team

As a minimum, the MMS team should include the Mohs surgeon, theatre nursing staff, a recovery nurse, and a BMS. In our unit we have a team who are specifically dedicated to the Mohs sessions, thereby providing continuity and allowing development of effective working relationships. To account for instances of annual leave or sickness, a further pool of suitably trained and qualified staff has been developed to minimise service disruption.

Our Mohs team comprises

Recovery nurse

A qualified nurse who is familiar with the MMS process. She has sufficient training to perform all pre- and

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