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OPINION ARTICLE

The Implantation of Mohs Micrographic Surgery in Spain: a Work Still in Progress☆

Potenciar la cirugía micrográfica de Mohs en España: una obra inacabada

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Nearly 80 years have passed since Frederic Mohs began to develop the technique that now bears his name. During this period, the use of Mohs micrographic surgery (MMS) has spread and taken firm hold in some countries (especially the United States, where it originated), but has been more unevenly taken up in others, specifically in Europe. Few randomized clinical trials have compared treatment options in nonmelanoma skin cancer, in part because it is difficult to justify that research design to prove the efficacy of conventional surgery for high-risk tumors or to demonstrate the efficacy of MMS for low-risk tumors. For many authors, MMS has 2 main advantages over conventional surgery: *a)* lower recurrence rates for certain tumors,[1] and *b)* smaller surgical defects.[2] This second advantage, directly related to the aesthetic results of surgery, is sufficient to justify the use of MMS in the context of some health care systems. At first glance, MMS does not appear to be an economical technique (compared to conventional surgery) because it requires an investment in time, an infrastructure, and trained staff. In the context of private dermatology, of course, the expectation of superior aesthetic results may be reason enough for the physician and patient to agree on the suitability of MMS. In public health systems, however, the introduction of MMS may meet with several objections. First, health care administrators and dermatologists will argue that it makes no sense to divert resources indiscriminately into a costly type of surgery. It is therefore important to establish rigorous criteria for selecting candidates for MMS. A possible starting point could be the guidelines of the National Comprehensive Cancer Network (http://www.nccn.org/index.asp). However, these guidelines were developed by consensus in US centers. In that country the value of MMS is well accepted, but the payment system there cannot be readily extrapolated to other countries. It is interesting to note, however, that the authors who have worked hardest in recent years to determine recurrence rates after MMS as well as the indications and cost-effectiveness of the technique are not in US research groups.[2–10] Indeed, rigorous analyses of the indications for MMS have come from European and Australian studies. The latter also show that it is possible to keep registries of a considerable number of a country's specialized surgical procedures. These registries, coordinated by the Skin and Cancer Foundation Australia, provided data for Igal Leibovitch, an Israeli ophthalmology resident who certainly took full advantage of his 2-year stay in Australia to publish a series of important studies, one after the other, in the *Journal of the American Academy of Dermatology*.

Recurrence rates after MMS are lower than those obtained with conventional surgery (thus improving cost-effectiveness) in basal cell carcinomas that recur, have been incompletely excised, or are histologically aggressive (micronodular, infiltrative, morpheaform, or those with perineural invasion) located in the H-zone of the face.[3,5–7,11–14] The indication for MMS rather than conventional surgery for squamous cell carcinomas has not been sufficiently evaluated.

MMS is performed in an increasing number of Spanish hospitals, both public and private. An indirect sign of this is Spanish authors' publication of numerous studies on the

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technique in both Spanish and international journals in recent years.[15–28] Especially important are the large case series of patients treated by MMS in the dermatology department of the Institut Valencià d'Oncologia, such as that reported in this journal by Angulo et al.[12] That facility's ample experience could probably be extrapolated to other Spanish hospitals that perform MMS; it would be extremely useful to organize a national network of hospitals and dermatologists using this technique in order to promote training in MMS (not part of the official training program at this time) among residents or dermatologists in Spain, to create registries, and to encourage the publication of results, as well as educate other specialists and users about the technique.

Once the indications for MMS have been established, those dermatologists and hospitals who are considering offering this procedure should begin by training the surgeon and the pathology laboratory technician. Unfortunately, as mentioned, such training is not officially regulated in Spain despite the numerous dermatologists who now commonly use it. Many dermatology residents have the opportunity to learn the basic principles of MMS during their residency, but the possibility of a post-residency super-specialization in accredited centers (like the year-long fellowship training program in MMS accredited by the American College of Mohs Surgery in the USA [www.mohscollege.org]) deserves consideration. There are also no detailed registries on the practice of MMS in Spain. Who performs it? What technique is used? Is fresh tissue examined or has the slow MMS technique been adopted? How many patients are operated on each year? In public or private hospitals? Who interprets the histologic preparations—the pathologist or the surgeon? Who closes the defect—the dermatologist or the plastic surgeon? Once the question of training (for which no institution is currently applying for any type of accreditation) has been settled, we will have to consider the cost of investing in the technique. The main investment needed to begin using MMS would be in a cryostat, a device that costs approximately €25 000. This expense is one of the obstacles many dermatologists working in public hospitals have come up against. This problem can be overcome, however, if fresh tissue is examined and surgery can be organized in an operating room close to the pathology department, which usually has these devices available for perioperative tissue sectioning. Even if we can obtain our own cryostat for use away from the pathology department, however, we will still have staffing issues to deal with. We will need to obtain a laboratory technician (just 1—not 2, 3, or more taking turns and who would require years to learn the ins and outs of sectioning and staining fresh tissue); and we will need a collaborating dermatopathologist to work with. In fact, in Spain it is the dermatopathologist who prepares the definitive report on the samples, either immediately (ideally) or later. As a result, we must discuss a ''plan B''—the use of slow MMS approaches that examine paraffin-embedded-tissue. Indeed, this type of MMS has become the technique of choice in fibrohistiocytic tumors (such as dermatofibrosarcoma protuberans) and in lentigo maligna. Although the method does not change overall, it goes by various names: Mohs surgery using paraffin-embedded tissue; slow-Mohs surgery, 3D histology; CCPDMA—or complete circumferential peripheral and deep margin assessment with permanent sections; the muffin technique, the perimeter technique, the quadrant technique, and the Tübingen Torte technique.[29] The common denominator, whether fresh or paraffin-embedded tissue is examined, is the histologic analysis of the entire excised margin around the lesion. This thoroughness distinguishes MMS from conventional surgery, which examines only slices of the margin (the bread loafing technique). The study of paraffin-embedded tissue has some advantages that are worth mentioning: the infrastructure needed for the fresh-tissue MMS technique is not needed, complex training is unnecessary, there are no limits to the size of the sample analyzed, and histologic interpretation is less complicated. However, delaying diagnosis can give rise to logistical problems related to operating room management and scheduling. In slow MMS we involve another department, becoming totally dependent on how well our hospital's pathology department is organized, a situation that will affect our scheduling of surgery.

MMS has been shown to be particularly indicated for the treatment of basal cell carcinoma with histologic risk factors, in cases of tumor recurrence, and in previously excised tumors with affected margins in the H-zone of the face. The slow MMS technique is relatively easy to introduce and can become the spearhead for establishing the approach in public hospitals, as the fresh-tissue technique demands investment in training, infrastructure, and logistics that in the context of the present public health system may require enormous resolve on the part of dermatologists. However, for those of us who use MMS, its usefulness in selected patients is beyond dispute and the effort required to establish it in more hospitals will pay off. In the future, standardized, accredited MMS training in Spain should be made available.

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