Acta Derm Venereol (Stockh) 1999; 79: 2–3

FOR DEBATE

The Case against Micrographically Controlled Skin Surgery

SAM SHUSTER

Medical School, University of Newcastle upon Tyne, United Kingdom

(Accepted June 5, 1998.)

Acta Derm Venereol (Stockh) 1999; 79: 2–3.

Sam Shuster, Medical School, Framlington Place, University of Newcastle upon Tyne, NE2 4HH, United Kingdom.

Micrographically controlled skin surgery (MCSS), based on a technique introduced by Moh (1), was once used in the few instances where local spread of basal cell carcinomas (BCCs) appeared to be out of control, but many are now using it for minor disease and as primary treatment of common skin tumours. I have never been convinced by the arguments for MCSS, and find no scientific reason for its world-wide advance in popularity. I have presented my case against MCSS only in lectures; my charge has never been answered, and MCSS continues to be promoted inappropriately. I now, therefore, set out the case against MCSS, because I believe it shows that MCSS should no longer be used as a therapeutic procedure until new studies establish in which situations, if any, it has merit. I do not propose to review the considerable literature on which my critique is based, since this has been done for me by a colleague (2).

The essence of MCSS is to search for and excise residual tumour. Marked tissue samples, taken from a saucer of tissue around and beneath the area from which the tumour has been excised, are sectioned horizontally to define residual tumour cells, which are then excised. The process is repeated until no histological evidence of tumour remains. Advocates of this procedure invariably cite the rare BCCs which recur despite wide excision, often spreading into the orbit or meninges. However, the belief that these tumours are best treated by MCSS, and that its use as primary treatment would have prevented their development, remains unproven. Yet the essential controlled studies are possible without undue risk, for example, by comparing procedures at different poles of a lesion. "Ethical" reasons for rejecting such studies are unsound; indeed, it is "unethical" to apply a procedure on the unproven assumption of its efficacy. But even if controlled studies did validate the use of MCSS for disaster BCCs, that validation could not be extrapolated to commonplace lesions. Likewise, if primary treatment of commonplace BCCs by MCSS was found to prevent the development of disaster lesions, primary treatment of BCCs by MCSS could not be justified to prevent the therapeutic escape of a rare few.

There is much confusion about the notion that certain types of BCCs have a high rate of recurrence and spread, and that MCSS would prevent this. For example, the apparent relationship of size of lesion at excision to recurrence rate (2) (not found by all (3)) is not proof that size *per se* discriminates intrinsic aggressivity; recurrence rate per unit of size, and related duration, may be no different. And even if further study proved that most "bad" lesions present initially as "big" lesions, it does not follow that all big lesions will end badly. Size at presentation cannot yet be used as a supportive argument for MCSS. Again, it might not be surprising if poorly pigmented Caucasian skin, exposed to solar radiation in Texan doses developed more and larger BCCs than occur under British clouds. But even if the behaviour of skin tumours is different in areas of high and low solar exposure, that difference might just as well argue in favour of keeping treatment different. The geographical argument does not generalize.

The case for MCSS for BCCs on particular facial sites is based on the site relationship of recurrences with other procedures (3, 4). While I am loath to disturb the mythical charm of some explanations for this, the sinister role of embryological fusion lines is more a fusion of irrelevant fact with forceful fancy. My recalculation of the published figures shows that most of the variation of recurrence rates at different facial sites is simply a function of the prevalence of tumours at those sites. As with so much in this field, better studies are required, not assumption of proof.

Recurrence is the core of the argument, but the increase in recurrence rate from $< 5\%$ after primary excision of BCCs to 13% or more after a second excision (2) has been widely misunderstood as supporting MCSS. Either a recurrence occurs at random, in which case its likelihood cannot be predicted earlier, or lesions which are going to recur (or the patients in whom they recur) are different from the beginning, in ways which only further study may eventually define. But, clearly, neither case can be used in support of MCSS. More simplistically, without knowledge of the clinical biology of a third, fourth and maybe fifth simple excision, there can be no case for treatment of recurrences by MCSS. The theoretical basis of MCSS is, of course, an underlying belief in the need to search for and remove all tumour rests to achieve a cure. But this is just dogma. Since, as those who practise the procedure are at pains to explain, MCSS frequently reveals residual rests of tumour after conventional primary excision, yet there is still a $>95\%$ cure rate, it surely follows that removal of tumour rests, the raison d'être of MCSS, is unnecessary?

Although this conclusion is logically unexceptional, I have tried to stress it experimentally. I found that in 100 consecutive patients with facial BCCs (average size 1 cm), which had previously been treated by simple primary excision, routine histology reports showed that excision was incomplete in 20. This prevalence of residual tumour, which is not exceptional (2), is more than 4 times greater than the expected recurrence rate. Furthermore, since the residual tumour was found in an unselected ribbon of only 3–5 sections cut at 5 μ from a 1-cm BCC in which the plain of sectioning was random, a similar finding could have been anticipated at whatever angle the tissue was cut. It can therefore be expected that serial sectioning would have revealed the tumour to have spread beyond the area of excision in most, if not all, cases. Thus, if the residual tumour

 ISSN 0001-5555

rests are important, close to 100% relapse would have been expected, not the <5% that is consistently found. The suggestion that cure entails search and removal of all BCCs is fantasy. To the contrary, the evidence is that the body is able to deal with the pieces of tumour left after conventional primary treatment in all but a few individuals.

The questions this conclusion raises go beyond the simple refutation of MCSS for BCCs, to the biology of skin tumours. Since it is now clear that we can destroy small amounts of this skin tumour, it is possible that in ageing and sun-damaged skin, which ultimately develops skin cancer, small tumours are developing and being eliminated continuously. This phenomenon could well explain what I believe to be the spurious contemporary "melanoma epidemic". The nature of the control mechanism and its relationship to tumour quantity and other determinants is open to thought and research; it certainly cannot be used, as it is at present, to justify removal of the "rests" of tumour. In short, the dogma of *search and remove*, the very basis of MCSS, is incorrect.

The final supportive argument is cosmetic. It is said that MCSS produces a smaller wound with less scarring than other procedures, reducing the need for plastic surgery. This could be an important advantage, but, even if further studies do show an improved cosmetic result in particular situations, this secondary argument can only justify MCSS in the restricted terms of any such proof.

So what is the future of MCSS, given that the evidence for it is inadequate for primary BCCs and recurrences, as well as for treatment of severe disease, and that there is no need for MCSS in the primary treatment anyway, since more than 95% do well, and any further reduction of recurrence would be too trivial to justify the considerable therapeutic effort and cost? The problem is that although MCSS may not be cost-effective, it is very fee-effective: a cynical view defines MCSS as a method for making 1 BCC pay as 3. In many countries it has become a major source of dermatological income and, not surprisingly, has begun to distract and distort the activities of academic departments, as well as inhibiting study of skin tumour treatment. In the absence of convincing practical or theoretical advantages, the therapeutic use of MCSS should stop, except than in a few centres in which the procedure should be used only in studies designed to establish what, if any, are its advantages. Unless and until MCSS can be proved effective for specific purposes, it can have no place as an established procedure. MCSS must not become removal of the irrelevant by the irresponsible.

In summary, micrographically controlled surgery was developed as a rational approach to the better definition and, thereby, removal of residual tumour. It has failed because the assumption that *search and remove* was needed turns out to have been incorrect for basal cell carcinomas, and because properly controlled studies were never used as a check to unbridled belief.

REFERENCES

1. Mohs FE. Chemosurgery. A microscopically controlled method of cancer excision. Arch Surg 1941; 44: 279 – 295.
2. Lawrence CM. Mohs surgery of basal cell carcinoma – a critical review. Br J Plastic Surg 1993; 46: 599 – 606.
3. Koplin L, Zarem HA. Recurrent basal cell carcinoma. Plast Reconstr Surg 1980; 65: 656 – 664.
4. Roenigk RK, Ratz JL, Bailin PL, Wheeland RG. Trends in the presentation and treatment of basal cell carcinomas. J Dermatol Surg Oncol 1986; 12: 860 – 865.