

The future of skin cancer surgery: what role for plastic surgeons?

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I recently incidentally noted a nasal skin lesion when reviewing a post-operative Dupuytren's patient. As we were arranging to biopsy the lesion, I was surprised to hear him remark that he was unaware that plastic surgeons 'do skin cancer'.

I wondered how representative this mis-conception might be, not only throughout the general public, but also in the medical community. I had previously taken an awareness of the role of plastics surgeons in skin cancer management for granted. Could it be that we have, as a craft group, become complacent in promoting the importance of plastic surgery in skin cancer treatment? And could it be that in that state of complacency, we have failed to stay adequately abreast of the revolutionary and rapidly-evolving developments in research and therapeutics in this dynamic field?

This incident prompted me to ponder several key challenges and questions facing plastic surgeons involved in treating skin cancer:

1. Has the role of plastic surgeons diminished in the changing landscape of skin cancer treatment options, and if so, why?

A changing workforce

Both the Royal Australasian College of Surgeons (RACS) and the Australian Society of Plastic Surgeons (ASPS) have always been in favour of patients receiving gold-standard, world class treatment from any practitioner that is fully trained and appropriately accredited to deliver it. In recent years, skin cancer has begun to be treated by a wider range of health practitioners, using an expanding array of treatments. Many

non-plastic surgery groups have entered the skin cancer 'space' recently, and focussing solely on skin cancer, they devote considerable time and advertising expenditure promoting themselves to the public. However, a large proportion of new entrants into the field as 'skin cancer surgeons' are not actually surgeons who have completed training through RACS. Members of the public are often unaware of this fact. Many of these doctors are general practitioners (GPs), educated in a relatively short period through newly-formed 'colleges' or 'internally regulated' groups and not accredited with a recognised peak college or public teaching hospital. These skin cancer courses may range from months to two to three years in duration—in contrast to the typical five to eight years taken for post-internship specialist reconstructive plastic surgery training. Due to the system of GPs as 'gatekeepers' of referrals to plastic surgeons, however, GPs with a skin cancer interest may see skin cancer patients 'off the street' without a referral, or direct them to another GP in the same practice, rather than onward to a specialist plastic surgeon. This trend is becoming more commonplace and is likely to increase in the future, but is this situation best for the patient? Certainly, competition and choice is usually healthy and increased numbers of practitioners improves access for patients. Indeed, our growing population needs better access to skin cancer-trained doctors and in a more expeditious time frame. From a health economics point of view and from the perspective of facilitating faster triage, it may be that a 'simple excision' by plastic surgeons becomes a thing of the past.

Changing patient expectations and demographics

Today's society demands instantaneous service. Despite improving access to doctors, however, community-based more 'express' training routes may give rise to other issues. Experience gained during many years of seeing high volumes of severe cases is irreplaceable. To the newer practitioner, the most extreme, urgent and life-threatening cases may be relatively foreign and beyond the scope of their training. They may feel out of their depth or not recognise their own limitations

when commonly encountered skin problems subtly increase in acuity or complexity as the clinical scenario evolves, for example, how rapidly subsets of more urgent skin cancers may become inoperable or require treatment in a tertiary centre in only a short period of time. Having embarked on a treatment path, those seeking to stake a foothold in the area may also feel more obliged to continue managing a patient 'no matter what' rather than ask for help.

Globally, there is poor recognition of the importance of early diagnosis and expeditious management of high-risk patients, such as those who are immunocompromised due to haematological malignancy, transplant-related or other immunosuppression, HIV/AIDS or autoimmune disease. Often these patients are incorrectly treated in a similar time frame as an immunocompetent patient. Similarly, poorly-differentiated SCCs or lesions in areas that may be high-risk for local invasion or metastasis (such as the scalp, the ears or facial lines of fusion), are often treated in a similar time frame as a low-grade, well-differentiated lesion should be. In any of these patient groups, it is imperative that expertise regarding all grades of disease severity or progression, in all manner of patient cohorts, be available to both the patients and doctors who may not be as used to looking after them, in order to ensure safe and optimal treatment.

Similarly, and all-too-often in these high-risk groups, we encounter examples in which inadequate oncological margins are accepted by a treating doctor, despite clear NHMRC guidelines to advise otherwise. This may be due to logistical reasons, medical comorbidities that make them high-risk in the first place, or a lack of confidence in managing the resulting defect. For example, we see cases of patients with numerous courses of topical treatment used on a tumour that has been refractory because the patient is deemed too high-risk for surgery or the area of the body too complex. In the end however, the resulting tumour may necessitate a needlessly large or complex resection and reconstruction, or palliative procedures. This scenario is seen commonly in the scalp of elderly or

immunocompromised patients, in whom neglected cases then require craniotomy and dural resection followed by cranioplasty and a free flap. In such situations, more definitive early management would have made such radical surgical options avoidable.

It may be that plastic surgical skin cancer practice in the future—as seen in other areas of medicine such as rheumatoid hand or cardiac surgery—consists mainly of patients that reach a specialist surgeon for tertiary opinion, for more histologically aggressive disease, salvage after disease recurrence, or because the patients are sicker, older, more high-risk, or require more specialised care (complex reconstruction of defects or surgery in cosmetically or functionally sensitive areas). Maybe, such a model for the plastic surgical care of skin cancer is in fact the most practical, economical and appropriate both for the health budget and for patients. Perhaps a legitimate role for the plastic surgeon in the area of skin cancer in the future incorporates a teaching resource or advisory role for community based practitioners, or treatment of more complicated surgical cases only. Overall, therefore, in this time of more diverse training and experience backgrounds seen among doctors engaging in skin cancer treatment, it is more important than ever that plastic surgeons are seen to be accessible and available to both patients and other medical colleagues.

2. What impact has the changing nature of skin cancer treatment had on how plastic surgeons practice?

The evolving landscape of cancer treatment, including in the area of skin cancer, mandates that plastic surgeons become conversant with new innovations in surgical and non-surgical treatments; and that they integrate seamlessly with complimentary specialists to provide optimal multidisciplinary care, where required.

Topical agents

Numerous topical or non-surgical skin cancer treatment options have found important application, such as treatment of SCC in situ with Effudix or superficial BCCs with Aldara.

These treatments carry one-year success rates of approximately 70%, and are very useful when used correctly, and when patients are available for close follow-up. Unfortunately, however, we often see simple skin cancers rendered more complex by delayed management or multiple attempts at recurrent/failed non-surgical approaches. Despite clear NHMRC guidelines, the use of topical treatments without histological basis is commonplace and are often repeated for many cycles without response (contrary to NHMRC guidelines). Frequently, patients may have been treated empirically without prior biopsy to identify the most suitable treatment agent for the particular histopathological condition. Even when biopsies have been performed, Effudix and Aldara are often seen as interchangeable and patients may persist with self-administered treatment cycles ad hoc when they ‘get a flare-up’. There is undoubtedly a cohort of patients who have suffered an under-appreciation of their disease severity in whom early definitive treatment may have avoided the need for salvage surgery.

Irrespective of these examples of incorrect application, these treatment evolutions have changed the landscape of the management of many skin cancers, particularly in areas such as the distal lower limb—in which avoiding surgery obviates the need for skin grafting, immobilisation and risk of causing DVT; in widespread field-change (in areas such as on the scalp or face); or in cosmetically sensitive areas in which a scar is better avoided (such as the nose or décolletage area). However, despite these key benefits, these topical agents have been seen by some as more medical therapies and some plastic surgeons may not be invested in the pursuit of patients deemed suitable for non-surgical treatments nor in their time-intensive follow up. This may be a reasonable decision however, a close collaborative relationship with a dermatologist or skin cancer-trained GP who can perform this role is imperative.

Systemic or immune therapies

Vismodegib is a new oral small molecule inhibitor targeting the transcription factors involved in the

Hedgehog signalling pathway for the treatment of advanced or recurrent BCC. The once impossible treatment of metastatic melanoma is now less a concept of sci-fi futurism than a treatment modality limited only (for now) by cost or authority approval. Vemurafenib, for example, has made possible the treatment of Stage III and Stage IV malignant melanoma with documented BRAF mutations. Intralesional therapy with agents such as coxsackievirus A21 is being combined with the cytotoxic T-lymphocyte-associated antigen 4 (CTLA-4) inhibitor ipilimumab in clinical trials for the treatment of metastatic melanoma that was, only recently, a veritable death sentence for the patient. Inflammatory gene expression and the lipidomes and proteomes are being mapped to characterise likely tumour treatment responses and to tailor therapy regimes in individual melanomas. The body's own defence mechanisms and the tumour specifics are being characterised, understood and harnessed to make the once untreatable, treatable; and the surgically treatable, suitable for medical therapy alone. Plastic surgeons have previously shied away from committing their trainees to gaining a formal, in-depth academic understanding of the basic science required to be conversant in this brave new world—much less to a level of expertise required to create, discover or pioneer new molecular therapies.

Mohs surgery

Mohs surgery and immediate microscopic examination of snap-frozen piecemeal tissue samples is marketed as a less invasive option than traditional surgery in which defined oncological margins are sought and verified in paraffin-embedded sections by a specialist pathologist. Indeed, Mohs surgery requires no external review by an independent pathologist and no maintenance of permanent and architecturally-intact blocks of tissue for later appraisal. Patients frequently enquire about Mohs surgery, however, are not often aware of the limitations involved and the facts that no quantifiable margins are obtained, frozen sections are employed and that the surgery takes place in the outpatient setting with no scope

for systemic anaesthesia nor later pathological review. They are also similarly often unaware that the resulting defects may require reconstruction by a plastic surgeon. Plastic surgeons must therefore understand the limitations but also the scenarios in which options like Mohs surgery may be a superior option to conventional excision.

Overall, the modern plastic surgeon has to employ a knowledge that also encompasses new technologies and the indications in which they may be used to better treat our patients; often in collaboration with dermatologists, pathologists, skin cancer GPs, and medical and surgical oncologists.

3. What role do plastic surgeons have in the management of skin cancer into the future?

It is my belief that plastic surgeons continue to play an invaluable role in skin cancer diagnosis and management particularly in the area of high-risk skin neoplasms and in skin cancers in high-risk groups. The adequacy of skin cancer training and treatment is especially important to the Australian population which still endures among the highest incidences of both melanoma and non-melanoma skin cancers in the world.

Plastic surgeons are uniquely placed to offer the entire spectrum of skin cancer surgery. This may range from topical treatment to tumour excision with local closure, grafting or flap repair, to nodal sampling or basin clearance of the groin, axilla or neck. They perform reconstruction of complex, multifaceted 3-D composite-tissue defects following primary tumour resection or disease salvage across all areas of the body. They are well-versed in applying the principles of reconstructive surgery all the way up the reconstructive ladder, right through to microsurgical free tissue transfer. A surgeon can only offer truly unbiased and uncompromising oncological margins if they are confident of their ability to reconstruct the resulting defect regardless of complexity or dimensions. Obviously, therefore, plastic surgeons remain fundamental to the process of complex reconstructive surgery—at the very least, every skin cancer team will need to include a reconstructive plastic surgeon.

Due to the rigorous and comprehensive training we receive in the Australian plastic surgery system, we add valuable perspective including awareness of potentially disastrous consequences of missed diagnoses, delays in appropriate treatment or inappropriate initial diagnostic or treatment decisions.

It is true, however, that the modern skin cancer specialist must be abreast of all aspects of treatment; and it is also true that a far greater emphasis is paid in non-plastic surgery journals to the non-surgical treatments for skin cancer. It is critical, therefore, that plastic surgeons be conversant in the latest trends in order to meaningfully integrate into the increasingly complex world of the multidisciplinary team. Therefore, they must also understand the roles played by other colleagues and how and when they should be involved, and what services and technologies they may offer.

The role of the *Australasian Journal of Plastic Surgery*

The *Australasian Journal of Plastic Surgery* (AJOPS) provides the perfect forum in which to bring together expertise and education from all areas of medicine and science for presentation in a plastic surgical user-friendly, digestible format. It provides a unique opportunity to create a platform that will become the key educational resource in skin cancer education for plastic surgeons.

At the 9th World Congress of Melanoma, which was held in Brisbane in October 2017, plastic surgeons were scarce among the throng of medical and surgical oncologists, dermatologists and skin-interested GPs. How many among us can say that they truly understand the recent changes to melanoma staging or the findings and statistical significance of the recently-delivered MSLT II study and the implications of the findings to nodal basin diagnostic or disease control surgery? How many plastic surgeons can discuss with patients or colleagues the research behind, and mechanisms underpinning, systemic and immune therapies and how this relates to clinical translation?

I believe it is the remit of this section of AJOPS to provide a forum for such education, incorporating

knowledge and research from all specialty craft-groups. It also provides the forum for us to discuss and enhance our evolving role in the field and to progress our standard of skin cancer practice for the benefit of our patients.

Steps for plastic surgeons to take as a specialty

1. Re-engage with research throughout our specialty and be the 'gatekeepers' of the product development that may result;
2. Add clinical perspective to basic science, such as identify biomarker parameters in primary tumours that may be useful to differentiate biologically aggressive tumours and upstage treatment;
3. Reinforce the practice of algorithmic and logical guidelines in keeping with the NHMRC guidelines in community and hospital practice;
4. Education of the public and our colleagues regarding our level of training, expertise and the role of plastic surgeons in skin cancer management; and
5. Act as a resource for different craft-groups practicing skin cancer surgery for the preservation of standards and protection of the public.

Conclusion

Presented here are some of the questions that we need to consider and provide solutions for, if we are to retain the traditional importance of the plastic surgeon as part of the skin cancer team. As the AJOPS section editor for melanoma and skin cancer, I encourage all plastic surgeons to have input into this important subsection of a new plastic surgery journal.

I hope that part of my role as section editor will be to encourage a forum for active debate regarding the place we hold in the spectrum of skin cancer practitioners and whether we do, indeed, deserve to be there. We may not rest on our laurels.

The melanoma and skin cancer section in AJOPS will also be used to provide accessible information and education for plastic surgeons regarding the fast-moving field of skin cancer research and finally, to provide a forum in which to foster

melanoma and skin cancer research by plastic surgeons themselves. We hope that together, such a combined approach will aid plastic surgery in being the best specialty that it can be in the area of melanoma and skin cancer, in the provision of a unique skill set and clinical perspective that we possess, for the betterment of our patients and for the upholding of professional standards in this field.

Disclosure

The author has no financial or commercial conflicts of interest to disclose.