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Look Good Feel Good

Plastic Surgery is a specialised branch of surgery that can be broadly divided into two parts: aesthetic (cosmetic) surgery and reconstructive surgery, though there can be considerable overlap between the two. The principle purpose of aesthetic surgery is to improve appearance. Reconstructive surgery, by contrast, is aimed at restoring appearance and function to normal. Dr Omar Ahmed, Consultant Plastic Surgeon and BAPRAS member, takes a look at the role of both disciplines

PLASTIC surgeons are expected to be equally skilled in both aesthetic surgery and reconstructive surgery. Reconstructive surgery is often required to repair body parts which are missing or deformed through developmental anomalies, or which are damaged through injury, burns, and cancer. The reconstruction of the affected body part usually requires the transport of tissue from one part of the body to another. Generally tissue is taken from an area of the body where it is less needed and moved to an area where the need is greater – in effect 'robbing the rich to pay the poor'.

Reconstructive surgery in cancer patients

Cancer and the complications of its treatment can affect virtually any part of the body. Plastic surgeons can, therefore, be called upon to reconstruct anywhere from head to toe. They are uniquely placed for this, in that plastic surgery is the only surgical specialty whose training and expertise is not confined to any particular region of the body.

In the United Kingdom, comprehensive cancer care has largely become centralised, with the majority of people being cared for by large, multi-disciplinary teams in specialist cancer centres. Plastic surgery is one of the core specialties involved in the care of a number of cancers, including head and neck, breast, skin, and soft-tissue sarcoma. In addition, plastic surgeons are often called upon to reconstruct tissue defects created by surgery for other cancers, such as colorectal cancer, urogenital cancer, and gynaecological cancer.

With their ability to restore form and function, plastic surgeons have a critical role to play in the overall management of those with cancer. Without the availability of reconstructive surgery, the removal of many cancerous tumours would not be possible, or would lead to mutilating deformities. An optimal reconstruction can be crucial, therefore, both in rehabilitation and in providing a long-term quality of life.

For example, many major cancers require two surgical teams for their treatment, with one team removing the tumour (resectional team) and the other team involved in the reconstruction (reconstructive team), with both teams often operating simultaneously. In such a situation the resectional team is able to remove the tumour without compromising the surgical margins, secure in the knowledge that the reconstructive team can be relied upon to reconstruct the body part involved.

Also, many tumours require treatment with radiation therapy in addition to surgery. When radiation treatment is planned after surgery for cancer (adjuvant radiotherapy), the provision of a stable reconstruction can facilitate the delivery of the radiotherapy by increasing the ability of the tissues to tolerate such treatment. This also applies to situations in which the tumour requires treatment with a very high dose of radiation delivered directly to the tumour via special wires (Brachytherapy). On the other hand, reconstructive surgery is often required to repair tissues that have been damaged by the effects of radiotherapy.

General principles of reconstructive surgery in cancer

The chief goals of reconstruction after the removal of any cancer are the restoration of appearance and function.

To restore appearance, reconstructive plastic surgeons try to replace that which has been lost, by similar tissue, in order to match the colour, texture, and contour of the part to be replaced.

The tissue used for reconstruction can be skin, fat, muscle, tendon, cartilage, or bone. In complex reconstructions several different types of tissue may be required. Replacing tissues 'like for like' in order to best restore appearance is more crucial in some areas, such as the face and hands, than others. For example, the skin of the face is usually replaced by flaps of skin from elsewhere in the face or neck, because this is of similar quality. Similarly, the nose is usually rebuilt by using skin from the forehead because such skin is closest in quality to nasal skin. When the amount of tissue missing is very large, however, it may not be possible to reconstruct with similar tissue. In this situation, reconstruction usually requires the transport of tissue from a distant site, potentially making it much more difficult to restore appearance to normal, especially in exposed parts of the body. This commonly involves microsurgery.

The types of functions that reconstructive sur-

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gery attempts to restore include speech, swallowing, movement, and continence. The best chance of achieving this again lies with replacing missing tissue with similar tissue, but it is generally much more difficult to restore function than it is to restore appearance.

Apart from the above principles, the choice of reconstructive technique also depends on the desires of the patient, the fitness of the patient, and the experience of the surgeon. A good rule of thumb is to use the simplest, safest, most reliable, technique that is compatible with the reconstructive goals.

'A well-planned reconstruction can provide the best chance of restoring functions such as speaking, eating, and swallowing'

When does reconstructive surgery for cancer take place?

In the majority of treatments for cancer, both the removal of the tumour and the reconstruction of the surgical defect take place during the same operation. This is called Primary Reconstruction. There are instances, however, where the reconstructive procedure occurs after the surgery for cancer. This is called Delayed Reconstruction. A common example of delayed reconstruction is in breast cancer, where breast reconstruction can sometimes be carried out weeks or months after a mastectomy.

Reconstructive surgery in specific cancers

Skin cancer

Skin cancer is the most commonly diagnosed cancer, and very commonly affects the face and other exposed parts of the body, such as the hands and, especially in women, the legs. Surgery for skin cancer can, therefore, be potentially disfiguring and reconstructive surgery is usually required in order to minimise such disfigurement. In the majority of cases, as explained earlier, the 'like for like' principle is applied to skin cancer defects, ie the tissue missing is replaced by similar tissue. For example, the appearance and function of the mouth is best restored if lip reconstruction is carried out by using tissue from the remainder of the lips. This is only possible for relatively small defects; for larger defects of the lip, tissue from the cheek has to be borrowed. This provides a good colour match, but the mouth does not function quite as well. Similarly, the skin of the nose is best replaced by a skin flap from the forehead, but large defects of the nose can require rib grafts for support and microvascular free tissue transfer to reconstruct skin and lining.

Breast cancer

In the United Kingdom, breast cancer accounts for almost a third of all cancers in women, in whom it is behind only skin cancer in incidence. Breast reconstruction is offered to the vast majority of women who undergo a mastectomy for breast cancer. The breast is a highly specialised organ and is impossible to replace with identical tissue. Instead, a new breast mound can be created by using a flap of skin and muscle from the abdomen, buttock, or back, often with the use of microsurgery. Sometimes a breast is reconstructed with an implant alone, especially in women who do not wish to undergo major surgery, but the resultant breast is never as natural looking as with the other methods.

Head and neck cancer

While head and neck cancer is less common than skin cancer and breast cancer, the tumour and its treatment can have devastating consequences for the patient. Combination treatment with surgery, radiotherapy, and often chemotherapy, is common, and complex reconstruction is often required. The head and neck region is so specialised that even removal of a small tumour can adversely affect functions such as speaking, eating, and swallowing. A well-planned reconstruction can provide the best chance of restoring such functions. Although occasionally local tissues can be used, in the majority of cases reconstruction needs to be carried out by microvascular free tissue transfer. The tissue transferred is often made up of more than one tissue type. For example, a tissue defect involving both the lining of the mouth and the lower jaw bone can be reconstructed by a composite flap of skin and bone from the fibula bone of the leg. Also, the tongue can be reconstructed by a composite flap of skin and muscle from the thigh or abdomen.

Occasionally patients can develop facial paralysis as a result of a head and neck cancer or its treatment. In such cases, facial movements can be restored by transferring regional muscles or by transplanting distant muscles, the latter requiring microsurgery.

Soft-tissue sarcoma

Sarcomas are tumours which can occur at any age, in both sexes, and in any part of the body. Surgical removal of such tumours can lead to massive tissue defects which often require multi-layer composite reconstructions.

What is the future?

Whilst it is possible that in the future we will have the ability to replace body parts with identical parts developed in the laboratory with the help of tissue engineering and stem cell technology, for the foreseeable future traditional reconstructive surgery is likely to continue to have a major part to play in cancer patients. ■