vice has been as well-earned as it is ennobling. But the truth must be told, and it must be admitted that for much loss of prestige and for an undoubtedly dwindling respect for the profession on the part of many of the public, medical men have only themselves to thank. The excuses which they make for their failure in this important respect are but the merest sophistry, and one cannot shut one's eyes to the fact that the public are beginning to realize this and to judge them accordingly. The best practitioners of our art have always been individualists, who have under-

stood that the satisfactory conduct of a case includes the care of the mind as well as of the body. They have known, moreover, that their duty does not stop short at the patient but includes the relatives and friends, to whose interest and anxiety they must also minister, for the sake of all concerned. It is only in so far as we remember this obligation and discharge it faithfully that we shall retain that trust and confidence which have in the past been among our most priceless possessions.

CUNCTATOR.

THE REMOVAL OF TUMOURS OF THE FACE AND NECK AND THE PROBLEMS OF REPAIR

By D. N. MATTHEWS, O.B.E., M.D., M.CH., F.R.C.S.

Surgeon, University College Hospital; Plastic Surgeon, the Hospital for Sick Children, Great Ormond Street, and the Royal National Orthopaedic Hospital

The excision of tumours may be called for because of malignancy, or the likelihood of its super-vention, or may be needed to overcome disfigurement in benign lesions. The tumour may be confined to the soft tissues or to the bony structures, or it may have spread from one to the other. A malignant neoplasm may have spread to the regional lymphatic glands or may be of a type apt to do so, in which case the plan for total extirpation of the disease will have to include an extensive dissection of the neck.

General Considerations

Age and Health

The surgical plan is often profoundly influenced by the patient's age. Young babies and old people are bad risks for long operations or extensive haemorrhage, and are quickly overcome by prolonged post-operative pain. Fortunately the majority of tumours found in infants are benign and surgery can be safely postponed. Those which sometimes grow rapidly in infancy, such as haemangiomas, can be held in check temporarily by injections until the child is old enough to withstand excision. The problem in old people is often more difficult, since most of the tumours which

afflict them are malignant. Great risks may have to be taken, and are fully justified when tackling a deadly disease. It is not justifiable, however, in such circumstances to add to these risks by embarking upon an elaborate method of repair. It is enough to close raw surfaces by suture, or to cover them with a skin graft. The deformity can easily be hidden by a prosthesis. This also applies to younger adults who have besides the tumour other diseases which increase the surgical risks; for example cardiac and pulmonary lesions often demand simplification of the reconstructive plan.

Certainty of Cure

In treating malignant tumours, it is essential that the surgeon's attention should be focused upon the necessity of cure, rather than the problem of repair. Excision must be radical enough to assure this, irrespective of the difficulties of reconstruction it creates. Moreover, should there be any suspicion that complete excision has not been possible, elaborate repair must not be undertaken. An early recurrence can easily be concealed by a skin flap for so long that the patient is incurable by the time it has been diagnosed. For instance, rhinoplasty may hide a recurrent nasal tumour un-

til the ethmoid and post-nasal tissues are irreparably involved. Instead, the wound should be closed by suture or covered with a skin graft, and watched for several months. Further excision or X-ray treatment will then be ensured without delay. Moreover, it may well be that premature surgical interference at the site of removal of such a tumour may increase the risks of recurrence.

The postponement of repair in doubtful cases in no way contradicts the axiom that, provided the surgeon is reasonably sure that the growth has been completely removed, it is best to perform the permanent repair at the same operation, if the patient is fit to stand it. This saves much pain and reduces the number of operations the patient has to face, thereby raising his morale and minimizing the period of invalidism.

Palliative Operations

Surgery is sometimes indicated even when radical excision of the disease is impossible. Such palliative operations are performed either to increase the patient's comfort or to enable the radiotherapist to continue treatment.

The excision of a fungating tumour may relieve the patient of pain and of an odour which is causing social embarrassment, besides reducing very considerably the chances of fatal haemorrhage. Under such circumstances only the simplest procedure which will achieve these ends is justifiable, and no form of reconstruction necessitating further operations is to be countenanced. The wound is closed in the simplest manner possible at the time of the excision, and the deformity subsequently hidden by a bandage or a prosthesis.

Surgical assistance to the radiotherapist is called for when there is evidence of recurrent activity in a growth which has already received as much irradiation as the overlying skin will allow. A carcinoma of the parotid is a good example. This may have recurred after excision and the recurrence been treated with X-rays and radium, or the primary growth may have been irradiated without excision. In either case the problem is the same; the new growth demands further radiation but the skin cannot be exposed again with safety. Excision of the irradiated skin and the provision of a new cover by means of a skin flap allows further radiation at once, since the flap is strong enough to withstand the effects of X-rays. Such a flap is rotated from the margin of the defect left by the excision, and the raw surface produced at the donor site is covered by a skin graft (Fig. 1). A defect over the parotid gland would be covered by a flap swung down from the scalp. The cosmetic result is satisfactory, because the radiotherapy epilates the hair-bearing part of the flap.

FIG. 1.—To illustrate a rotation flap. A flap has been turned down from the scalp to repair a defect left by the excision of a large tumour of the maxilla extending into the cheek, orbit and nose. The donor area on the skull was covered with a skin graft. The flap enabled further irradiation to be given to the affected area.

Principles of Operation

Pre-Operative Planning

When the nature of the tumour allows, it is desirable to give the method of repair much careful consideration before excision is undertaken, particularly when it is obvious that a skin flap will be required. It may be found that a flap is needed which either cannot be provided locally or will cause too much additional scarring. The skin must then be brought from elsewhere, and the advantages and disadvantages of using the chest, the abdomen or the arm will have to be weighed. Whichever is selected, preliminary plastic surgical procedures will be needed to prepare the flap and move it. Obviously these considerations are overridden when the nature of the tumour brooks no delay in excision. Reconstruction has then to be either modified or postponed. Similarly when bony excisions are planned it may be desirable to prepare dental cap splints to retain remaining portions in their correct positions. Removal of

FIG. 2.—Immediate repair of defects of cheek and nose. Skin cover sewn to underlying mucosa. Cheek defect plugged with gauze tampon.

half the mandible, for instance, would be followed by gross displacement of the remainder unless it were fastened to the overlying maxilla.

Secondary Distortion

When it is impossible to synchronize the excision and the repair, the wound from the primary operation should not be drawn together if this causes secondary distortion. After removal of a tumour of the cheek the lax tissue surrounding the defect may tempt the surgeon to try this, but the temptation must be resisted if closure produces an ectropion or asymmetry of the angles of the mouth. Such through-and-through wounds should be closed by sewing the mucosa to the skin all round the defect and the hole plugged with a gauze tampon to prevent surface excoriation by saliva (Fig. 2). If closure is achieved at the cost of secondary distortion the first step towards subsequent reconstruction has to be the recreation of the defect to allow the displaced tissues to return to their normal positions. The same principle guides the surgeon in closing wounds left by the removal of part or all the nose. The skin of the lateral wall is sewn to its lining to cover the nasal bone, and the two mucosal surfaces of the septum are sutured over the septal cartilage or the vomer. The nostrils are thus left wide open. If the lateral walls are bound down to the septum by suturing them together, they will have to be released subsequently before rhinoplasty can be performed.

Immediate Necessities

When surgical excision requires the sacrifice of an eyelid, its replacement with an adequate non-irritating cover is an immediate necessity; otherwise corneal ulceration will occur. If sufficient conjunctiva remains, only a skin flap is needed to back it up, but when the lining has to be sacrificed as well, this must also be replaced at the same time. Similarly, exposure of the gums will be followed by gingivitis and loss of the teeth unless an adequate cover is quickly provided.

Methods of Repair

Skin Grafts

A skin graft is a thin piece of skin cut from the body and set in place over a wound where it becomes attached, so closing the defect. These are cut with a knife or a razor, or with a calibrated instrument called a dermatome (Fig. 3). Minute variations are possible in the thickness at which a graft is cut, and affect very greatly the cosmetic result and its viability in adverse conditions. At most it consists of the full thickness of the skin and never includes subcutaneous fat. It is obvious, therefore, that although it has many uses in repair after the excision of tumours, it also has its limitations. Clearly it cannot be used to make good through-and-through loss extending into epithelial lined cavities such as the cheek, nose or pharynx. Nor can it provide a repair which is cosmetically acceptable after a deep excision such as is often required to cure a malignant growth. It can, however, provide a temporary epithelial cover in such circumstances whilst the patient awaits a more elaborate repair. This prevents the contractures and infections which would inevitably occur in these cases if the primary wound were left open, and it saves the patient pain.

Free grafts do, however, provide a very satisfactory permanent repair in many cases. Excisions which are wide but superficial are readily amenable to this simple form of reconstruction. A pleasing result is obtained provided care is taken to select a graft of appropriate thickness, and meticulous attention is paid to operative detail. Skin grafts find their greatest usefulness, perhaps, after the removal of large benign tumours such as haemangiomas or moles, particularly in children in whom these lesions are common (Fig. 4). They also provide a satisfactory cover where speed and simplicity are needed. The patient's age or frailty may dictate this, or the extensive nature of the lesion. A free graft, then, provides a satisfactory cover over which a prosthesis or a bandage can be worn to hide the deformity.

In young children and elderly subjects the mere excision of a tumour may be a very formidable pro-

A

B

C

D

FIG. 3.—Dermatome. (a) Convex surface painted with adhesive solution. (b) Donor area painted. (c) Knife cutting skin as it is drawn up on to the drum. (d) Graft cut free from leg.

A

B

FIG. 4.—Repair with skin graft. (a) Hairy mole of face. (b) Result from skin graft cut with dermatome. Photographed two years after operation.

FIG. 5.—Repair with local flaps. Pharyngectomy and tracheotomy for carcinoma of pyriform fossa. Sufficient pharyngeal mucosa could be left to provide lining. Cover provided by swinging skin flaps inwards from both sides of the neck.

cedure. Cutting a graft then adds considerably to the chances of severe post-operative shock. This can be avoided by cutting the graft a week or so earlier and preserving it by cooling. In an adult it may be cut under local anaesthesia and in a child under a momentary whiff of ethyl chloride. The graft is stored by wrapping it in vaseline gauze and placing it in a household refrigerator, in an airtight screw-cap container. Storage in no way reduces its viability.

Skin Flaps

A skin flap contains subcutaneous fat and fascia on its under surface and therefore has wider applications than a skin graft. It can restore the normal contour after deep excisions; it has sufficient thickness to provide durability at pressure points; it simulates the normal laxity of the skin and subcutaneous tissues; suitably lined, it can bridge through-and-through defects such as those occurring after excision of the full thickness of the lips and cheek. It can be used to cover bare bone, bare cartilage, and tendon devoid of fascial or synovial cover, in all of which situations a skin graft fails.

During transference, however, from donor to recipient site, a skin flap must have an adequate blood supply at all times, otherwise it will die. In this respect it differs essentially from a skin graft, which is cut free from the body at the donor site with a razor and sewn to the defect, where it be-

comes reattached. The transference of a skin flap is therefore a delicate procedure, the successful accomplishment of which demands judgment and experience. Moreover, it may necessitate several operations spread over many weeks.

Donor site. The decision to effect the repair with a skin flap immediately raises the problem of the most suitable donor site. The essential problem in most cases is to decide whether it shall come from the face, neck or forehead, despite the secondary scarring this causes, or if it shall be brought from the chest, abdomen or arm where the scarring can be hidden.

The urgency for the removal of the tumour may settle the problem without argument, since almost all except local flaps require preparatory operations to move them into place or to increase their viability. Similarly, the patient's age or fitness may cast the die in favour of a local flap, since it is the simplest technically and can be performed at the same time as the excision (Fig. 5). Hirsutism or the texture of the skin of the torso may also force a decision in favour of a local flap. But where alternatives do exist and time can be allowed to prepare and move flaps from a distance, the patient's wishes should be most carefully considered. A surgeon may derive great satisfaction from the successful employment of a local flap only to find the patient horrified and bitter on seeing the secondary scarring it has caused. This is particularly true of young adults

FIG. 6.—Repair with chest pedicle flap. Based at the shoulder tip, the flap can be swung up to the face without intermediate attachment. Hand tethered to opposite shoulder to raise the base of the flap to the face. Head movement restrained by elasto-plast over linen head cap. Area excised was a large excavating rodent ulcer.

FIG. 7.—Intermediate attachment of abdominal flap to hand. Position of attachment carefully planned so that when the arm is moved the flap falls into position over the defect.

and the parents of children. Young patients are nearly always best treated by choosing the longer but less disfiguring methods of repair.

Planning. In planning a flap two considerations are of paramount importance. It must have an adequate blood supply to ensure its viability and it must be large enough to fit easily into position without tension. Whenever possible a local flap should be designed to contain one of the main arteries of the face or scalp. When this is not possible, as on the neck, its base must be as wide as the required rotation allows. Unless the surgeon is very experienced, it is wise to test the ability of the proposed flap to close the defect and the practicability of rotating it into position before raising it. This is done with a jaconet pattern cut to the shape of the inked outline of the flap, and held where the base will be whilst the tip is moved.

When a skin flap is to be brought from a distance, it is equally important to ensure that it is large enough and that its blood supply is adequate while it is being moved. Similar planning is therefore undertaken with a jaconet pattern. If the chest is to be used, the flap should be planned with its base at the shoulder tip so that it can be swung straight up to the face (Fig. 6). If the abdomen is to be used it is necessary to attach one end of the flap to the forearm near the wrist in order to

lift the skin to the face. By using the wrist in this way as an intermediate host, the time taken to transfer the skin over so great a distance is greatly reduced. In such cases it is of the utmost importance to attach the flap to the wrist at such an angle that, with the forearm bent, it falls accurately into place at the recipient site. The use of the jaconet pattern ensures this (Fig. 7).

Technique. The flap must be raised by meticulous dissection at a sufficient depth to include the blood vessels, and it must be of uniform thickness. All bleeding points on the under surface must be secured, in order to obviate the risk of haematoma formation beneath it. The application of ligatures is preferable to coagulation with the diathermy. Similar care must be taken to stop bleeding at the donor site so that the skin graft with which it will be covered will 'take.'

Preparation of flap. When a flap from the chest or the abdomen is to be used, its transference can be facilitated and the safety of the procedure increased by performing a preliminary operation designed to improve its circulation and to obviate all risks of infection during transfer. This is achieved by undermining the skin through parallel incisions, one on each side of it, and sewing the two cut edges together. The flap then consists of a tube attached at each end to the body like

FIG. 8.—Abdominal pedicle flap. This is sewn into a tube as a preliminary procedure to improve its blood supply and to protect its under surface from infection as it is moved.

suitcase handle (Fig. 8). The chest or abdominal wall is closed behind it by drawing the two cut surfaces together. The detachment of the central part of the flap in this way is followed by a rearrangement of the vascular pattern during the next six weeks, so that large vessels traverse it from end to end.

The conversion of the flap into a skin-covered tube protects its subcutaneous surface from exposure and infection during transfer. But it does not involve any sacrifice of width, which is fully recovered by incising the seam and unrolling the edges before sewing it into position at its destination. When preparing a skin flap as a tube in this way, it is usually best to make the side cuts parallel to each other rather than to follow small irregularities or indentations which the jaconet pattern contains. These can be reproduced by trimming the flap when it reaches the face. Obviously the side cuts must be wide enough apart to include the maximum width of the jaconet pattern. To ensure the viability of the flap, it should not be less than 3 in. wide if it is 6 in. long. It can, of course, be wider if the pattern demands. If it has to be longer it should be proportionately wider. If more than 9 in. in length are needed it is best to make two flaps. These can be attached to the wrist by their inner ends side by side and so lifted to the face together.

Timing of Operations. The time which must elapse after construction of the tube before it can

be moved is often of great importance when the tumour to be removed is malignant. The greater the width in proportion to the length the sooner it can be moved with safety. For a flap 6 in. long and 3 in. wide six weeks is the usual time which is allowed to elapse. But the adequacy of the circulation can be ascertained by testing the ability of drugs to pass into the general circulation after their subcutaneous injection into the pedicle. By this means it may be found that the pedicle is ready for transfer much sooner. Atropine is usually injected, since the resulting diplopia, dry mouth and tachycardia are readily detectable.

In the case of the acromio-thoracic pedicle, its inner end is detached and the pedicle swung upwards to the face on its outer attachment over the shoulder tip. The inner end is unrolled as far as is necessary and the cut edges sewn to the margins of the defect left by the excision. Three weeks later the pedicle is cut from the shoulder, unrolled and trimmed to the size and shape of the lower margin of the defect, and inset. By careful selection of the place at which the tube is transected, quite a large part of it can often be left attached to the shoulder tip. This can be returned to the chest wall if the scar line left on it by the construction of the tube is tight or uncomfortable; otherwise it is discarded.

An abdominal flap is attached to the wrist by its inner or outer end, whichever is the more convenient, after a similar delay or satisfactory atropine test. Three weeks later the opposite end is detached from the abdomen, the wrist brought to the face and the open end of the pedicle unrolled and inset to the defect. Three weeks later, the wrist attachment is severed and the reconstruction completed. It will be seen that all stages are performed at intervals of three weeks, except the initial move following the construction of the tube. This usually necessitates a wait of about six weeks.

Lined flaps. When a lining as well as a cover is required, it is provided by skin except when making good the loss of conjunctiva. Skin irritates the eye and a mucosal replacement should be found for an eyelid if the globe is still present. Skin is, however, quite satisfactory for the cheek, the lips, the nostrils, the pharynx and the cervical oesophagus. The employment of two skin flaps would seem to be the obvious solution to the problem, with one rotated so that its cover faces inwards and the other swung over it, skin outwards. Each can then be sutured to the edge of the defect it is to replace. The closure of a hole in the cheek with a lining flap turned upwards from the neck and a cover turned downwards from the forehead would illustrate this procedure. Unfortunately, however, the combined thickness of the two flaps makes the result clumsy.

A

B

FIG. 9.—Repair by local flaps. (a) Defect at nose tip. (b) Lining provided by rotating flaps inwards from the margins of the defect. This is done three months after sound healing of the suture lines left by the original excision.

There are two alternatives. The lining can either be provided by local flaps based at the margins of the defect, or by a free graft. The former method cannot be employed to reconstruct synchronously with excision, since the local flaps need for their blood supply a soundly healed muco-cutaneous suture line at the margin of the defect where they are based. It is unsafe to raise such flaps until these suture lines, closed at the time of the excision, have been soundly healed for three months. But provided this time is allowed to elapse, and provided the tissue surrounding the defect is healthy and can be utilized without making the closure of the enlarged surface defect more difficult, the employment of local lining flaps and a covering pedicle from elsewhere is often the best method (Fig. 9). An oesophageal defect may also be made good in this way. Similarly the cheek may be repaired by this method provided the size of the defect is not so great that the eyelid

or lips have to be disturbed to provide the lining and provided the viability of the surrounding skin has not been reduced by radiotherapy.

In such circumstances it is better to reconstruct the lining with a graft. This is cut with a razor from a part of the body which is not hirsute, and buried under that part of the abdominal or thoracic acromial pedicle which is planned to lie over the defect, before the pedicle is moved. Thus it becomes attached to the pedicle and is lifted with it three weeks later to the face. By lifting a small skirt of pedicle surrounding the buried graft, exposed subcutaneous tissue and a cut edge are provided which can be dovetailed to similar raw surfaces created at the margins of the defect (Fig. 10).

When synchronous excision and repair are needed, a free graft as a lining also provides an alternative to the employment of two pedicle flaps provided it is possible to fix a temporary prosthesis

C

D

FIG. 9 (continued)—(c) Lining flaps covered by flap turned down from forehead. Nostril shape maintained by prosthetic appliance. (d) Base of forehead flap returned after three weeks. Donor area on the right side of the forehead covered with skin graft. Hirsutism prevented by the use of the chest or abdomen.

with which to hold the graft against the under surface of the covering flap. This is simple for the cheek or lips, since the dental surgeon can fix a suitable appliance to the teeth. He can sometimes adapt the same kind of apparatus to hold a nostril graft in place, but it is extremely difficult to repair the oesophagus or the pharynx in this way. Local lining flaps and a covering pedicle flap used at a second operation three months after excision are more satisfactory.

Mucosal Grafting

The provision of a conjunctival substitute with which to line a flap reconstructing an eyelid is often difficult. The mouth is the usual source and the graft is cut from the lower lip or the cheek. A piece of mucous membrane 2 in. in length and 1 in. in width can be taken from low down in the buccal sulcus without distorting the lip. But where the alveolus projects only slightly care has to be taken not to unseat a denture by obliterating

the sulcus completely. A mucosal graft has, however, a very great tendency to shrink, and in so doing to narrow the covering skin flap by rolling it horizontally. More mucosa is often needed therefore than can be taken from the lower lip; the graft has then to be taken from the inner side of the cheek. The loss in this situation is best made good by means of a thin skin graft taken from a non-hirsute area, such as the inner side of the upper arm or the abdomen. It is held in place by a prosthesis fixed to the teeth until it has taken. In women, however, there is an alternative which is very satisfactory. The mucosa of the labia may be taken without creating any distortion after closure of the wound by suture; the graft provides a conjunctival substitute which is large enough for the purpose of the repair, and perhaps even less irritating to the globe than the buccal mucosa. This method can also be used on occasion in children, where it is often impossible to obtain enough mucosa from the lower lip and where there is a

A

B

FIG. 10.—Lined flaps. (a) Through-and-through defect of cheek. (b) Chest pedicle prepared and skin graft buried on the under surface of its lower end.

natural reluctance to condemn the child to a permanent skin lining to the cheek.

The best skin flap for the reconstruction of the missing eyelid is the skin of the opposite lid. It is swung down or up, as the case may be, on double pedicles, one at each canthus. The wound in the donor lid is closed by suture if the lid is sufficiently baggy, or resurfaced with a skin graft if this is impossible. If for any reason the opposing eyelid cannot be used, a flap has either to be swung down from the forehead or provided as part of a larger flap being brought from elsewhere to make good other defects as well. No matter whence the flap comes, the mucosal graft is laid beneath it, raw surface outwards, and tacked to it with a few fine interrupted sutures. Great care must be taken to ensure that it is wrapped round the horizontal free edge of the skin flap to protect the globe from this rough surface. Pressure exerted by the underlying globe is sufficient to keep it firmly in contact with the skin cover.

When the eye has been lost and lining is needed for the socket in order to fit a shell, mucosa rather than skin should be used whenever possible. Skin

often causes an irritating, offensive discharge (Fig. 11).

Bone Grafts

These may be needed, after excision of facial tumours, to rebuild the mandible, the nasal bridge, the forehead, the malar prominence or the orbital floor. In no case should they be inserted until the soft tissue reconstruction is complete and the induration resulting from the surgical trauma has subsided.

The ilium is very satisfactory for all facial reconstructions. Its cancellous bone can be packed firmly against the irregular facets of the remaining pieces of the bony framework, where it vascularizes and consolidates quickly. The thin cortical plates of the ilium can be used as well, where greater strength or a more even contour is needed.

The cancellous bone is cut into small chips so that it is little more than a bone paste, which can easily be inserted through a small incision. It is then moulded into shape with the fingers and held in place by the overlying soft tissues until it has consolidated. Frontal and malar reconstructions are

copyright.

Protected by

FIG. 10 (continued)—(c) Pedicle with underlying adherent skin graft brought up to face. (d) Result.

FIG. 11.—Orbital reconstruction. (a) Defect of outer canthus repaired by forehead flap. (b) Retention apparatus to hold buccal mucosal graft into socket. (c) Result with artificial shell fitted.

FIG. 12.—Mandibular reconstruction with iliac crest graft after removal of all except ascending ramus on right. This was stabilized by extra oral pin fixation to the malar bone. Graft was introduced through submandibular incision three months after removal for adamantinoma.

best made in this way. The nasal bridge can also be built of cancellous tissue, but perhaps the inclusion of a small cortical strut subcutaneously gives a more pleasing result and a more natural feel. Mandibular defects should be bridged by a strut which is straight or angled according to the shape of the defect, and this should be covered by chips packed all round it. Provided both remaining pieces of the mandible are immobilized by dental appliances or extra-oral pins, there is no need to secure the strut at either end (Fig. 12). The orbital platform consists of a thin triangular cortical plate which is raised to the correct height by chips wedged beneath it.

Fascial Grafts

The excision of facial tumours often necessitates the sacrifice of the facial nerve. In such cases the cosmetic result can be greatly improved by elevat-

ing the cheek and the corner of the mouth, and by assisting the elevation of the lower lid and the closure of the eye. This can be done by the insertion of strips of fascia lata. One strip encircles the paralysed angle of the mouth, passing along both lips close to their free margins so that it can be sewn through the muscles of the side which is not paralysed. The second strip interlocks the first at the angle of the mouth and is threaded upwards through the cheek so that it can be sewn to the temporal fascia or fastened round the zygomatic arch. This elevates the angle whilst the first strip reduces the width of the oral commissure to normal. A third strip can be inserted, if necessary, to elevate the cheek if it is drooping below the horizontal ramus of the mandible. A fourth strip is sometimes threaded through the lower eyelid close to its free margin, and anchored to the nasal periosteum or even passed back through the upper lid.

FIG. 13.—Facial palsy. Reconstruction with fascia lata strips and lateral tarsorrhaphy.

There are many refinements designed to improve the results, such as lateral tarsorrhaphy, or re-animation by attaching part of the masseter muscle to the sling, but the essential feature of the repair is the insertion of the fascia. It can be performed just as readily if the excision of the tumour has necessitated a preliminary reconstruction of the soft tissues with a skin flap (Fig. 13).

Prostheses

These may be worn on the surface to hide a deformity or they may be placed beneath the skin to replace a missing part of the bony skeleton. In the latter instance they are inserted into the mouth or passed through it into the nose. When used to simulate the nasal framework, such a prosthesis is inserted through an opening in the upper buccal

sulcus into a skin pocket which has been inlaid as a graft behind the nasal skin. It holds this skin forward, being fixed by a clip to the upper teeth like a denture.

Surface prostheses are usually made of synthetic resin and are expertly coloured to match the normal tissues. They may be held in place on a spectacle frame for defects of the nose or orbit, or may be stuck to the underlying skin with spirit gum. Auricular prostheses are usually held in this way.

I wish to record my thanks to my colleagues for permission to publish photographs of patients whom they have referred to me for reconstruction, and to the staffs of the photographic departments of University College Hospital and the Hospital for Sick Children.