

## A NEW OPERATION FOR THE SURGICAL TREATMENT OF SEVERE CONTRACTION OF THE SOCKET

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In adults the surgical treatment of a contracted socket is necessary either to improve the appearance of the patient, to make it possible for him to wear an artificial eye in comfort, or to relieve his discomfort by the control of constant and chronic discharge. In children surgery is undertaken to enlarge the immature socket so that it will eventually retain a suitable artificial eye in adult life.

In an industrial country such as the United Kingdom the treatment of contracted sockets is a frequent necessity and there are also many examples which are the result of enemy action in two World Wars both amongst civilians and ex Servicemen.

The most successful results are not entirely due to the work of the surgeon, since to the surgery must be added the skill of a first class technician who is able to make suitable modification of standard artificial eyes and contact prostheses.

### *Principles of Treatment.*

In order that a standard artificial eye can easily be worn without extrusion and irritation several conditions of the socket must be satisfied. The lower fornix must be of adequate depth and must not be too shallow; the depth must be equal along the whole length of the fornix and the fornix should not be crossed by conjunctival adhesions. It is more important that the depth of the lower fornix shall be firmly established rather than that of the upper fornix. Nor is it necessary to have a deep socket in order to retain an artificial eye; indeed sometimes this is a disadvantage and in the past too much attention has been given to the depth of the socket.

One feature, however, is essential and that is to remember that the best cosmetic results with movement are obtained when the artificial eye is held firmly between the pressure of the lids in front against the base on which it rests, whether the base is a movable stump, orbital tissue, or a buried implant. Too much stress cannot be placed on this factor and the result is well seen where a thin contact



Fig. 1-2-3-4. F. act 52. Old leucoma adherens with secondary glaucoma and anterior staphyloma. The cornea, anterior uveal tissue and lens were removed; the sclera and conjunctiva were sutured in separate layers and a good stump was obtained (Fig. 1). A contact artificial eye was worn with complete comfort (Fig. 2) and good movement was possible with a satisfactory cosmetic result (Figs. 3 and 4).

artificial eye is simply placed over a movable globe and held firmly against it by lid pressure. In such a case the movements of the artificial eye are free in all directions and far surpass anything which may be obtained with orbital implants.

It is often a wise procedure, in suitable cases, not to enucleate the whole globe but just to excise the cornea, anterior uveal tissue, and lens. The sclera is then firmly closed by sutures and covered by conjunctiva thus constructing a mobile stump. Against this stump a contact shell can be placed with a satisfactory cosmetic result.

We have reached the conclusion that it is helpful to excise the lacrimal gland completely in all cases of enucleation. This prevents the excessive moisture which plagues most sockets of any duration and thereby reduces the possibility of chronic infection. The mucous secretion of the conjunctiva alone is quite sufficient for adequate lubrication of the lining of a socket and artificial eye without the excessive inflow from the lacrimal gland.

#### *Principles of Surgery*

There are three phases in reconstruction of a socket, namely, 1, lower fornix reconstruction, 2, upper fornix reconstruction, 3, general reconstruction.

In the reconstruction of a socket which has moderate contraction of one or both fornices it is essential to remove all subconjunctival fibrous tissue which is responsible for the contraction, and this may often involve a deep dissection of the orbit: unless this fibrous tissue is removed completely there will inevitably result contraction of subsequent grafts later. When the fibrous tissue has been entirely removed a raw area is left which it is necessary to graft. An accurate assessment of the amount of tissue required may be obtained by the use of oiled silk which is pressed against the raw area: the blood stain on the oiled silk accurately delineates the raw area and enables accurate grafts to be fashioned from mucous membrane with due allowance for subsequent shrinkage.

The free grafts suitable for socket reconstruction are generally taken from the inside of one or both cheeks and should be as thin as possible: if these mucous membrane grafts are thick they will inevitably ooze later and lead to excess of moisture. Sometimes it is possible to obtain a small piece of conjunctiva from the upper fornix of one or other eye.

Skin is not a suitable tissue for lining a socket and it should never be used in conjunction with mucous membrane as the moisture from the mucous membrane invariably causes excessive desquamation of the skin with the production of an offensive odour. Skin is used when there has been an exenteration of the orbit and where it is not possible to obtain sufficient mucous membrane to line it: in such a case the skin must be kept completely dry or again an offensive odour may result.

The surgical principles for the reconstruction of conjunctival fornices are well known: it is essential that the free graft of mucosa be held firmly against the raw area in the fornix and maintained in position either by a head cap splint or by a gutta percha mould. Our preference is for a gutta percha mould combined with a complete tarsorrhaphy; the mould is retained for at least four months. The tarsorrhaphy is constructed by splitting the whole length of both lids along the grey line: this produces an anterior and posterior flap in the lid tissue. By an intracuticular suture the two anterior flaps are joined together and slightly everted: no tissue is excised and there is no distortion of the lash line. When the tarsorrhaphy has served its purpose it can easily be divided and the edge of the lid quickly resumes a normal appearance. It must be emphasized that the tarsorrhaphy should run from the outer canthus right up to the lacrimal canaliculi if the mould is to be retained in position: if the tarsorrhaphy is merely in the middle third of the lids the mould will surely extrude itself from one or other side of the adhesion.

Sometimes it is possible to obtain a mobile stump in a deep socket where the eye has been removed many years before: this is by the use of a delayed implant. The shrunken Tenon's space is opened up and the muscles are defined: into the area thus exposed an acrylic ball of 14-18 mms. is placed and subsequently buried by bringing together the muscle tissue over it. The conjunctiva covers this stump as a separate layer. There is generally considerable improvement to the base of the orbit and a useful stump is obtained. Occasionally a dermolipomatous graft from the abdomen can be used to fill up the depths of a socket, but more commonly this is used to deal with an exaggerated supra-tarsal sulcus in an upper lid after enucleation.

#### *Total Excision of the Socket*

To reconstruct a socket entirely by the use of free grafts at several operations is a time consuming procedure which necessitates much hospitalisation of the patient, and often the eventual cosmetic result is a disappointment. In an industrial country time spent in hospital is important to the economy of the patient and to industry: our experience of total reconstruction by free grafts has persuaded us to think of another method which would be shorter in length of hospital stay, and give a better cosmetic result.

Such a method has been devised by the total obliteration of the socket and the use of a contact prosthetic appliance which is stuck on the skin or carried on a spectacle frame.

#### *Technique of the Operation*

This operation is done where there is complete contracture of the socket in all directions and where there is practically no fornix, either above or below, with lateral contraction of the canthi.

CONTRACTION OF THE SOCKET



Fig. 5-6-7. F. aet 48. This patient had marked contractum of the left socket owing to pemphigus: She was quite unable to wear an artificial eye (Fig. 5). The socket was completely excised (Fig. 6). A contact prosthesis was applied (Fig. 7).

Anaesthesia is by the hypotensive method and at present the drug "Arfonad" is the method of choice: by hypotensive anaesthesia bleeding is reduced to an absolute minimum and the differentiation of tissue planes is made easy. Where this type of anaesthesia is contra-indicated the operation table is given a tilt of  $45^{\circ}$  to the horizontal which also diminishes haemorrhage.

The first step in the operation is to extend the outer canthus by an incision as far as the fronto-zygomatic suture. The lids are then held widely apart on traction hooks and the whole mucous membrane of the socket is exposed. The mucous membrane is then carefully dissected in one piece from the posterior surfaces of both lids and from the depths of the socket. No deep tissue is removed as this will be useful to constitute a soft pad after operation. The lacrimal gland is completely removed from the lacrimal fossa and all bleeding points are carefully stopped, though with hypotensive anaesthesia there is usually very little haemorrhage. The lash lines are then excised together with the lacrimal puncta and



Fig. 8-9. M. aet 14 had bilateral retinoblastoma. After radiation there was marked contracture of both sockets (Fig. 8). Both sockets were excised (Fig. 9) with much increases in comfort, and contact prostheses were mounted on spectacle frames.

#### CONTRACTION OF THE SOCKET

canaliculi. Deep structures are drawn together with catgut and the raw edges of both lids are carefully sutured by interrupted sutures: all blood is expressed before the final suture is tied. A firm pressure bandage is then applied for four days.

At the end of fourteen days the incision has firmly healed and a smooth skin surface is the result.

It is essential to excise the lacrimal gland in every case or a fistula will probably result.

After the skin has firmly healed the patient is transferred to the care of Mr. Warren of Messrs. Clement Clarke Ltd., Wigmore Street, London, who then provides the prosthesis.

If the patient is in the habit of wearing spectacles the prosthesis is clipped on to the affected side. If, however, the patient does not wear spectacles then the prosthesis is made to adhere to the skin by the use of Mastisol tissue glue.

The advantages of this operation are, 1, that the patient stays in hospital for about ten days and that he is generally up and about on the third day: 2, that the cosmetic result is excellent and far better than could be obtained by several operations on a socket which shows gross contraction: 3, the prosthesis is clean and requires no after care: 4, the risk of repeated anaesthetics is avoided.

In our experience patients who have undergone free grafts for the reconstruction of sockets and then subsequently had excision of the socket much prefer the latter procedure and are well satisfied with it. The illustrations show the cosmetic effect.

*I am indebted to Mr. Gordon Clementson, Director of Photography, Queen Victoria Hospital, East Grinstead, for the illustrations.*

Queen Victoria Hospital