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A CASE OF ACCIDENTAL SPONGE-GRAFTING OF THE CONJUNCTIVA OF EIGHTEEN MONTHS' DURATION, WITH SOME SUGGESTIONS UPON SPONGE-GRAFTING IN EYE-SURGERY.

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THE case herewith reported presents two interesting features:

I. The conditions under which the foreign material was introduced and the length of time it remained attached to the conjunctiva.

II. A beautiful illustration of the so-called process of sponge-grafting, which may suggest for it some further uses in eye-surgery.

The case was that of a colored girl, sixteen years old, who came to Wills' Hospital, complaining that there had been something growing in her right eye for the preceding eighteen months. On examining the eye I found a small swelling on the outer portion of the lower lid, giving the appearance of a fair-sized chalazion. As I drew down the lower lid to expose the palpebral conjunctiva a small mass protruded, yellowish in color, from which exuded a thin, purulent discharge, and resembling a papillomatous growth in appearance. Subsequent questioning showed that the girl had been an inmate of the House of Correction, having been discharged from that institution last August, after two years' confinement, and that six months after admission she noticed one morning this growth in the eyelid. She consulted one of the female attendants, and was told to bathe the eye in hot water. After two weeks of this treatment and the growth not disappearing, the attendant resorted to surgical means and attempted to remove it with a pair of forceps. This time she was more successful, securing a portion of the sponge and with it some of the conjunctival tissue, and causing some bleeding from the lid.

As I could not account for the presence of the growth, and also as it resembled sponge in character, I directed my questions with that object in view. The girl then stated that all the girls in her department washed themselves with one large sponge several times a week, and that often after washing she had noticed small particles of sponge adhering to her skin. With this history I then examined a piece of the mass microscopically, and found it to be indeed sponge. The photograph taken did not turn out well, so I cannot show the position and relation of the sponge in the conjunctival sac. On examining the lid more closely I found the sponge firmly implanted in the palpebral conjunctiva toward the outer side of the lid, yellowish in color, oval in shape, and with ragged edges; it was 8 mm. long, 7 mm. wide, and 3.5 mm. high. As for the remaining portions of the eye, they were apparently normal, with the exception of that portion of the ocular conjunctiva that came in contact with the sponge when the eyelid was closed. Here the vessels were somewhat enlarged and the conjunctiva slightly hyperemic.

It would seem improbable that a foreign material the size of the piece of sponge stated, consisting of a substance subject to very septic surroundings (*i. e.*, a sponge used in the House of Correction on all kinds of people until it became so rotten that it was falling to pieces), could remain so long in the conjunctival sac without causing the slightest discomfort and only a very little irritation ; but I think, if we look into the condition more closely, the absence of symptoms can be accounted for, as the sponge, being of soft animal tissue, becoming attached to the conjunctiva, the granulations springing up in the interstices of the sponge virtually made it a part of the lid itself, and it therefore caused no more irritation than any other small piece of granulation-tissue in the same position.

As a case of sponge-grafting, the formation of new tissue, as seen in the sketch of the section, shows it to be a perfect success.

FIG. 1.

Showing granulation-tissue intersected by sponge-fibers. × 30°.

This method of using sponge to replace lost tissue was first suggested by Prof. D. J. Hamilton, of Edinburgh, in 1881, who recognized the fact that in the organization of tissue the blood-clot or fibrinous lymph plays only a mechanical and passive part in any situation in which the organized tissue becomes replaced by a fibrous cicatrix. This being the case, he hit upon the idea of using sponge as a substitute, as the interstices of the sponge resembled the fibrinous network in a blood-clot or in fibrinous lymph, and at the same time being an animal tissue it would undergo tissue-digestion.

The process that occurs when a piece of sponge is placed in contact with an exposed surface and remains long enough is that a quantity of fibrinous lymph is effused into the sponge; this lymph becomes organized, and then is replaced by granulation-tissue, which extends and fills the interstices of the sponge, with, finally, a total absorption of the sponge-skeleton itself, leaving only a mass of cicatricial tissue.

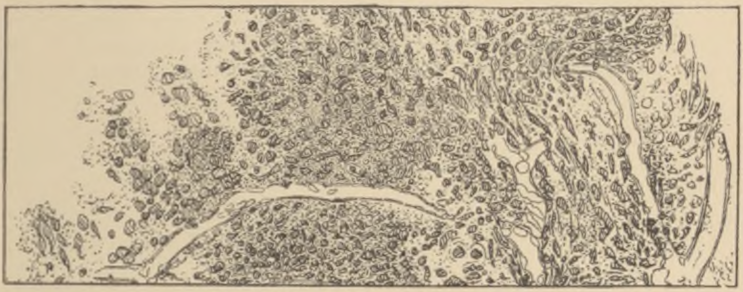
The girl refused to allow me to remove the entire sponge at that time, but agreed to the removal of a small portion. This was excised, with a small piece of the surrounding tissue, which was cut and mounted by Dr. Charles W. Burr. In hardening the section the free portion of the sponge, that part not being infiltrated by new tissue, was detached from the remainder of the graft. This accident is almost impossible of avoidance, owing to the destructive effect of the hardening fluid on the sponge. I am, therefore, unable to show all the stages from the deep granulation-tissue to the lymph in free sponge.

The section presented the following appearance: A mass of granulation-tissue in different stages of development intersected in all directions by a network of yellowish bands that represent the sponge-skeleton. The base of the new growth is composed of embryonic, more or less developed, connective tissue, which in the deeper layers has quite replaced the sponge-fibers. Above the deep part, gradually shading from it and filling the interstices of the sponge, is the new tissue, which consists of new granulation-tissue, blood-cells, leukocytes, giant-cells, etc.

The evidence of tissue-growth by aid of sponge-graft is clear, but the mode of absorption or disappearance of the sponge-skeleton is as yet unknown, although this undoubtedly occurs, as we find in the deeper layers that the sponge skeleton is more reduced in size and the fibers are fewer in number.

It is commonly believed, although the section does not show it, that absorption is due to an eroding influence of the giant-cells analogous to the action of the osteoclasts in bone-formation, as they are found in great numbers closely adhering to sponge-fiber.

FIG. 2.



Showing absorption of sponge-fibers. × 450.

In my sections there are several places showing giant-cells in close contact with the fibers, but I cannot see any evidence of absorption from this cause. I find, also, that these giant-cells are numerous in only the superficial portions of the graft, where we would not as yet look for absorption, and are extremely rare in deeper portions where the absorption takes place. My own opinion is that absorption is more probably due to a softening or separation of the fiber of a laminated structure by the pressure of the densely packed surrounding granulation-tissue, and, finally, absorption by the juices of the tissues, as the disappearance of the sponge is seen in only the deeper layers and apparently affecting the whole fiber at the same time.

So far as I can learn, this is the first instance in which sponge has been grafted, either intentionally or accidentally, on the conjunctiva. From the undoubted evidence of formation of new tissue, from the non-irritating properties of the sponge as seen, from the means under which it was introduced and the length of time it remained in the conjunctival sac, and from the microscopic proof of its final absorption, we have every reason to believe that sponge-grafting is a valuable means of replacing tissue lost by burns or injuries to the eyelids, which are eventually followed by ectropion, entropion, symblepharon, etc., and from the disfigurement caused by shrinking cicatrices.