Short Communication/Kurze Mitteilung

Bioplast® Fibrin Implants in Nasoseptal Perforation

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Summary. This study includes 9 cases of nasoseptal perforation following submucous septectomy. Sheets from Bioplast fibrin, an absorbable biomaterial, were implanted to prevent the persistence of perforations. Postoperative mucosal growth on both implant surfaces ensured closure in 6 of the 9 cases. The method has the advantage of simplicity and it is commendable in the case of smaller defects when the mucosa is not markedly atrophic.

Key words: Bioplast — Fibrin implant — Nasoseptal perforation.

Introduction

Perforation is a rare complication of septectomy performed with a proper surgical technique. In spite of the utmost care, however, discontinuities of the opposing mucous membranes may develop especially in the anterior and middle third of the nasal septum. In the course of healing smaller or larger perforations develop at these spots, which may be practically asymptomatic, but in other cases they can be the source of various complaints.

Several methods have been proposed for closure of perforations but these have failed to find general acceptance as they are usually not simple and efficient at once.

Procedures are known, where the subperichondrially resected septal cartilage is used for the prevention of perforation, by replacing it between the two mucosal layers. A disadvantage of this simple method, giving otherwise good results, is that just in difficult cases primarily in traumatic septal deviation, it is generally impossible to obtain an adequately large piece of septal cartilage.

The objective of the work reported was to see if Bioplast fibrin can be substituted for septal cartilage in the intraoperative closure of nasoseptal perforations.

Material and Method

Virtually the only absorbable implant material available to date, Bioplast was first prepared by Gernandás in 1955. Implants are compression molded from stabilized fibrin which is produced from fibrinogen
obtained during blood plasma fractionation. Bovine fibrin powder is heated to 150°C to destroy or reduce antigenicity. Glycerin is used as a plasticizer for moulding at 130–140°C at a pressure of 100–600 kp/cm² (Gerendás, 1968).

Physically, Bioplast is a yellowish-brown, translucent and flexible material which can be sterilized by gamma irradiation. Biologically, it is non-antigenic and capable of being absorbed by polymorphonuclear digestive action. Biodegradation resembles blood clot organization. The rate of absorption is controlled by pre-treatment with formaldehyde. Elimination proceeds at an even rate presumably via the kidneys, while the site is invaded by host tissue.

In female urinary stress incontinence bean shaped implants restored normal urethral shape and position (Horn et al., 1975). Fibrin films substituted for necrosed conjunctiva were replaced by new conjunctiva (Tapasztó and Kerényi, 1977a). Bioplast covering skin defects around the eyes was replaced by fresh skin (Tapasztó and Kerényi, 1977b). Implanted after jawbone cystectomy, fibrin accelerated healing (Kovács and Kerényi, 1976). Other applications include the treatment of varicose ulcers, haemostasis in liver operations (Wood et al., 1976) and after tooth extractions in coumarin anticoagulant therapy (Kovács et al., 1976), the use of rods for scleral buckling in retinal detachment (Grósz et al., 1976), or of buttons preventing out-cut of sutures in difficult herniae, etc.

In Great Britain, ox fibrin implants, marketed under the trademark Biethium are manufactured under Hungarian licence by Ethicon Ltd.

The plates used in this work were 40 x 30 x 1 mm in size, made from human fibrin and slightly cross-linked to give a resorption time of about 1 month. The mechanical properties of the implants were similar to those of the septal cartilage. Of the presterilized plate, a sufficiently large piece was tailored during surgery. This would overlap the margin of the perforation all round. It is placed securely between the 2 mucosal layers. Both nasal cavities were tamponed with Vioform gauze stripes, which were removed 4 days postoperatively. An antibiotic, in most cases oxytetracycline, was administered for 4 or 5 days. Patients were discharged usually on the seventh day following surgery.

Results

Since March 1973, Bioplast plates were implanted in 9 cases following submucous septectomy. In the course of surgery in all the 9 patients a discontinuity occurred on both opposing layers of the septal mucosa, which would have resulted in the development of permanent nasoseptal perforations during healing. In the history of 2 patients an earlier fracture of the nasal bone was mentioned as the source of their nasal respiratory complaints. The implant was always fixed between the 2 mucosal layers. Both nasal cavities were tamponed with Vioform gauze stripes, which were removed 4 days postoperatively. An antibiotic, in most cases oxytetracycline, was administered for 4 or 5 days. Patients were discharged usually on the seventh day following surgery.

For the purpose of evaluation, the size of the mucosal lesion was assessed. Deficiencies larger than 1 cm in diameter were qualified as large perforations. Five of our cases belonged to this group.

Follow-up examinations were performed every week following discharge from hospital and the results were evaluated 2 months after surgery. There was no perforation on the nasal septum at the last control in 6 cases, the septum reached its normal thickness and corresponded in every respect to the optimally healed post-septectomy state. Permanent perforation developed in the further 3 patients. Two of the unsuccessful cases belonged the group of large perforations.

Discussion

Bioplast implants have been successfully used for the temporary replacement of deficient tissue in many fields of surgery.