FIBRINOGEN GLUE AND BIOCOMPATIBLE OSSICULAR PROSTHESSES

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Since 1978 the biocompatible prostheses have generally been used in our department to restore the collumellar effect in tympanoplasty. We have implanted more than 300 such prostheses, and after trying the Proplast type and then Plastipore, we now prefer Ceravital. The technique for their use is well documented, but the stability of the mounting remains uncertain during external dressing, as well as following the operation.

Fibrinogen glue, which is reliable, well tolerated and convenient to use, maintains the implants in a good position, and could transform the tympanoplastastic techniques.

PRINCIPLES AND PROPERTIES

Fibrinogen glue (Tissucol, Immuno Laboratories) is an extract of blood plasma, concentrated 30 times. We use it in a lyophilized form. In reproducing the last stages of coagulation, it makes, once stabilized, a real blood clot. After use in the ear its duration is extended to 15 days by the addition of two factors to the original fibrinogen which reinforce the mechanical stability of the coagulate: factor XIII and Aprotinin. Their presence slows the action of substances which degrade fibrinogen. The polymerization of fibrinogen into fibrin is induced by the presence of thrombin, whose action is catalysed by calcium chloride. This fibrin formation makes a light mesh net and is the basis of the adhesive properties of Tissucol.

Principles of TISSUCOL

APROTININE (Factor XIII)
Human FIBRINOGEN
Bovine THROMBIN

Polymerized FIBRIN

\[ \text{CaCl}_2 \]
METHOD OF PROPERTIES

The Tissucol comes in a number of bottles which have to be carefully mixed in three steps.

1. One makes a dilution of aprotinine (bottle A+B)
2. The aprotinine is injected into the fibrinogen. The mixture is heated at 37°C and well agitated. The glue is then ready for use. Conserved at 37°C, it is stable for 4-6 hours.
3. The ampule of calcium chloride is mixed with the lyophilized thrombin. The mixture is conserved with the glue after agitation.

USE

At the moment of use, the fibrinogen and the thrombin are taken in two separate syringes. In our tympanoplasties we do not use the double barreled syringe proposed by the manufacturer because it limits the visibility in the operative field. The polymerization starts when two components mix. They can be mixed in any order. The glued fragments are maintained in place for about 30 seconds, after which the adhesion is sufficient.

PARTICULARITIES FOR USE IN TYMPANOPLASTY

The reconstruction of the middle ear starts with the placement of the tympanic graft. For the implantation of the prosthesis and the glueing, we use two different techniques.

A) The ossicular prosthesis is brought to the ear suspended at its end with an aspirator finely regulated with an inertial pedal. A drop of glue and then a drop of thrombin is put at the end of the stem. Excess glue is removed using a second aspirator. The prosthesis is put in place on the head of the stapes, or on the plate depending on the case. After having put some bone powder on the plate of the prosthesis, a drop of the components is added. The tympanic graft is folded back and glued with the wall of the tympanic cavity.