# AUTOLOGOUS TISSUE ADHESIVE IN OPHTHALMOLOGICAL SURGERY

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## Background and Importance

The replacement of suture by tissue adhesives has gained importance in the last few years. However, commercialized sealants are allogenic, synthetic and expensive, increasing surgery costs.

## Aim and Objectives

- To produce an Autologous Tissue Adhesive (ATA) easily compounded for ophthalmic surgeries.
- To show evidence about the safety and the efficacy of the ATA through preclinical studies.

## Materials and Methods

1. **Compounding ATA:** fibrinogen and thrombin were prepared from blood plasma by precipitation, purification and concentration in the buffer solutions.

   ![Image of compounding process]

   - **90 mL whole blood**
   - **40-50 mL blood plasma**
   - **580 g plasma in 8 min**
   - **Split 1:1**
   - **2 mL x 2**
   - **20 mL to prepare 2 mL of fibrinogen**
   - **20 mL to prepare 2 mL of thrombin**

2. **Evaluation of cytotoxicity ATA in vitro:** cell viability of a 3D corneal model was studied after exposition to the ATA, according to the method of QobuR 1.

3. **Study of in vivo adhesion:** ATA was used to glue a conjunctival autograft on sclerotic performing a Pterigium surgery in White New Zealand rabbits (4 males, 12 weeks).

4. **Grafting follow-up in vivo** (for 14-28 days).

5. **Grafting study ex vivo:** by hematoxylin-eosin staining.

## Results

3. **Clinical evolution and histology**

   - [Image of clinical evolution and histology](#)
   - **Post-surgical**
   - **Day 3**
   - **Day 7**
   - **Days 14-28**
   - **Magnification: 100X**
   - **Magnification: 200X**
   - **20mm² autograft could be fixed successfully with 0.5-0.7 mL ATA.**
   - **Time of the surgery for tissue adhesion was minimal (3-5min).**
   - **The clinical evaluation was positive.**
   - **Animal showed neither inflammation nor adverse events.**

## Conclusion and Relevance

- Since in ophthalmic surgery the volume of ATA needed is very low, it can be **easily compounded in a hospital pharmacy** from a small sample of blood from the patient.
- This ATA is **safe and efficacy**, supported by our preclinical results. This ATA could be an **excellent low-cost substitute** for the sutures and commercial sealants in ophthalmic surgeries.

## References