**INTRODUCTION**

The simple underlay myringoplasty has evolved, enabling it to be performed more easily and safely. However, this procedure needs fibrin glue that is made from donated temporal bone. Temporal bone histological stability of the fibrin membrane and gel were evaluated using image analysis equipment. The density of the fibrin fiber was measured at the time of production, 24 hours, 48 hours, 72 hours, 1 week and 2 weeks after the operation. The fibrin membrane had less microscopic changes even at the 2-week assessment. There was no statistically significant difference between the density of the fibrin membrane fiber and the fascia at 2 weeks. In contrast, the fibrin gel had melted and disappeared in 2 weeks.

**MATERIALS AND METHODS**

1. Sixteen ml of peripheral venous blood were obtained from five healthy volunteers using blood collecting tube with ACD-A (5ml) and rapid clotting tube (5ml). Thrombin, platelet poor plasma (PPP) and platelet rich plasma (PRP) were obtained by centrifugal separation.

2. Addition of thrombin to PPP resulted in fibrin gel formation. Addition of thrombin to PRP resulted in PRP gel formation. Fibrin gel was grouped in Group A (without compression and dehydration) and Group B (with compression and dehydration).

3. Fibrin gel and fibrin membrane was incubated at 37°C in 0.3% osoemic soaked gelatin sponge. We evaluated the histological stability of the fibrin membrane and gel using image analysis equipment. The density of the fibrin fiber was measured at the time of production, 24 hours, 48 hours, 72 hours, 1 week, and 2 weeks after the operation. Fasica of the temporal muscle was used as control. Welch's t-test was used for the statistical analysis.

**RESULTS**

- **Group A (Fibrin gel)**
  - At the time of production
    - The density of the fibrin fiber was measured at 24 hours, 72 hours, and 1 week after the operation. There were less microscopic changes in the density of the fibrin fiber for 2 weeks. Also, fascia of the tympanic membrane as a control was stable for 2 weeks.

- **Group B (Fibrin membrane)**
  - At the time of production
    - There was no statistically significant difference between the density of the fibrin fiber and the fascia at 2 weeks. In contrast, the fibrin gel had melted and disappeared.

**DISCUSSION**

Based on some previous reports, PRP discharges PDGF (platelet-derived growth factor), TGF-β (transforming growth factor-beta), VEGF (vascular endothelial growth factor) and these growth factors accelerate wound healing. Therefore, we have tried to apply PRP to the repair of the ear drum. It is thought that the autologous fibrin membrane has equal stability as fascia and also the fibrin membrane might produce a base for the regeneration of the tympanic membrane as a substitute for the subcutaneous connective tissue or fascia. If sampling of the fascia is not necessary, we can establish a safe and less invasive surgery. Fixation of the membrane with gelatin sponge, without fibrin glue made from blood achieved no risk of the infection. It is also conceivable that the gelatine works as Drug Delivery System of PRP.

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**REFERENCES**

[1] 1. Trim the edge of the perforation and fill the tympanic cavity with gelatin sponge soaked with OFLX. 2. Insert the PRP gel to the external auditory canal and add the thrombin to PRP in the canal. PRP gel will be produced in the canal. Fill the canal with gelatin sponge with OFLX and fix the fibrin membrane.

**CONCLUSIONS**

We produced the autologous fibrin membrane and gel from small amount of peripheral venous blood. The fibrin gel was as stable as the fascia by compression and dehydration. We successfully performed devised myringoplasty using autologous fibrin membrane and gel, and this procedure may establish safety and less invasive myringoplasty.