Autologous fibrin glue with growth factors in reconstructive maxillofacial surgery.

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Abstract:

The aim of this paper was to describe a method for the preparation of autologous fibrin glue with platelet growth factors and to report its use with particulate cancellous bone in reconstructive maxillofacial surgery. The fibrin glue is a two-component glue, where the one component is a concentrated fibrinogen solution with platelet growth factors and the other component is a thrombin solution. Both components were produced from the patients own blood, thus making the glue entirely autologous. The glue was prepared from platelet rich plasma separated from 200 ml of the patient's blood prior to the operation. The fibrinogen in the glue was precipitated from the platelet rich plasma by ethanol precipitation at low temperature and separated together with the platelets by centrifugation. Raising the temperature to 37degreeC redissolved the precipitate. The thrombin solution in the glue was produced from prothrombin precipitated from 10 ml of the platelet rich plasma by lowering the pH and the ionic strength. The precipitate was separated by centrifugation and dissolved in a calcium ion solution. Increasing the pH to neutral value induced activation to thrombin. Preparation of the fibrin glue was performed in the blood bank within 60 to 90 min with the use of standard equipment. The outcome from 200 ml of blood was approximately 8 ml of fibrin glue: 6 ml fibrinogen to be coagulated with 2 ml of thrombin. The glue had a fibrinogen concentration of approximately 12 times the value in platelet rich plasma and the concentration of growth factors was approximately eight times the value in platelet rich plasma. We have used this glue successfully with particulate bone grafts for reconstructive purposes within the oral and maxillofacial field. It might as well be applied to other surgical areas. Whenever larger amount of the glue will be needed, a whole

unit of blood may be taken from the patient, and the red cells re-transfused to the patient during or after the operation.