Application of atelocollagen sheet for sellar reconstruction.

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Abstract:

We aimed to evaluate combined use of atelocollagen sheet and fibrin glue for sellar reconstruction. Experiment 1: A plastic chamber was prepared with a hydroxyapatite lid with a hole of 10 mm in diameter at its center, covered with a Gore-Tex sheet (W.L. Gore & Associates, Tokyo, Japan) 15 mm in diameter and sealed with a combination of fibrin glue sealant and either atelocollagen sheet or polyglycolic acid (PGA) sheet. Air was injected into the chamber and the pressure at which air leakage occurred was measured under each situation. Mean (+/- standard deviation) leakage pressure was 816 +/- 162 mmH<inf>2</inf>O for atelocollagen sheet (n = 5), significantly higher than the 557 +/- 130 mmH<inf>2</inf>O for PGA sheet (n = 5, p < 0.05, Wilcoxon test). Experiment 2: Bilateral 5 mm bone windows were made in the temporal bone in eight rats. The surgical cavities were filled with one of four materials (fibrin glue only; fibrin glue and atelocollagen sheet; PGA sheet; or autologous fat tissue). Histological changes including the status of implanted materials and inflammatory responses were investigated 2 and 5 weeks after the procedures. Both atelocollagen and PGA sheets remained at 5 weeks after implantation, whereas fibrin glue and fat tissue were absorbed and undetectable at 2 weeks. Inflammatory cell accumulation was less around the atelocollagen sheet compared to the PGA sheet. The combination of atelocollagen sheet and fibrin glue sealant showed sufficient adhesion force and favorable tissue affinity, suggesting this combination as a feasible material in sellar reconstruction.