Endoscopic skull base reconstruction

Achieving an effective endoscopic skull-base reconstruction in case of large dural defects requires specific training and can be extremely challenging. The aim of a study of Mattavelli et al. from Brescia was to describe the development and validation of a preclinical model for cerebrospinal fluid leak repair, which can be used for training and to test the mechanical efficacy of endoscopic skull base reconstruction.

Eleven fresh-frozen cadaveric heads were dissected. A catheter was inserted in the subdural space via a cervical access, which was sealed with mastic; a vertical graduated tube connected to the catheter measured intracranial pressure (ICP), while stained water was injected intracranially. After endoscopic skull base reconstruction was performed, an expert surgeon assessed its efficacy. ICP was then gradually increased until a leak was evident and CSF leak pressure value was recorded. The correlation between subjective and quantitative evaluations was investigated through Pearson and Spearman correlation tests.

The model was successfully tested in 11 specimens. A single, large dural defect was created in each model (transtuberculum transplanum approach = 4; transplanum-transtuberculum-transsellar = 3; transclival = 3; transcribriform-transplanum = 1). Skull base reconstruction always comprised a rigid buttress with temporal fascia and/or fat. The CSF leak pressure ranged from 4 to 110 cmH2 O. The correlation between expert subjective and quantitative assessment of skull base reconstruction mechanical efficacy was high (r = 0.7; rs = 0.7; p = 0.010 and p = 0.006, respectively).

This preclinical model is simple, easily reproducible [1)].

1)
Mattavelli D, Ferrari M, Rampinelli V, Schreiber A, Buffoli B, Deganello A, Rodella LF, Fontanella MM, Nicolai P, Doglietto F. Development and validation of a preclinical model for training and assessment of cerebrospinal fluid leak repair in endoscopic skull base surgery. Int Forum Allergy Rhinol. 2019 Oct 1. doi: 10.1002/alr.22451. [Epub ahead of print] PubMed PMID: 31574591.