Natura abhorret a vacuo--use of fibrin glue as a filler and sealant in neurosurgical "dead spaces". Technical note.

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Abstract:

OBJECTIVE: The objective of this study is to report our experience and illustrate our technique in the use of fibrin glue in the treatment of post-operatory cerebrospinal fluid (CSF) leaks and collections following different neurosurgical procedures.

METHODS: In a 3-year period, 40 subjects underwent endoscopic endonasal approach for different sellar and skull base lesions (three tuberculum sellae meningiomas, six craniopharyngiomas, three Rathke's cleft cysts and 28 pituitary macroadenomas), in which an intraoperative CSF leakage was evident. In such subjects, the fibrin glue was used as a first step of the final phase of the procedure-i.e. the reconstruction of the skull base defect-followed by the other materials employed. Furthermore, ten other patients, who had undergone transsphenoidal (four cases), spinal (two cases), posterior fossa (three cases) and transcortical intraventricular tumour removal (one case) neurosurgical procedures and developed CSF leaks or collections, were conservatively treated by single or repeated in situ injections of "modified" fibrin glue under local anaesthesia according to different described techniques. In total, 50 patients constitute the clinical material of the present study.

TECHNIQUE: In the cases where the fibrin glue was used during the reconstruction phase of the procedure (40 cases), the glue was injected inside the tumour cavity to fill the dead space left by the removal of the lesion. In case of post-operative CSF leak or CSF fluid collection (ten cases), after

discarding 50-80% of the thrombin solution to obtain prevalence of the product's adhesive properties, fibrin glue was injected directly in the path of the CSF leak or into the collection cavity after aspiration of the collection's content. This was performed with the provided application system or through lumbar or Tuohy needles. Applications were repeated every 48 h until the disappearance of the leak. In all the treated cases, the disappearance of CSF leaks or collections was obtained with a number of applications ranging from one to five. Successful results are stable with a follow-up ranging from 6 months to 3 years.

CONCLUSIONS: In our experience, the injection of fibrin glue has proved to be effective in filling or sealing post-operative "dead spaces" and treating minor or initial CSF leaks resulting from procedures of transsphenoidal, cranial and spinal surgery, adding another possibility in the management of many of these dreadful complications.