Ventricular catheter misplacement occurs in 40 % with freehand technique and is a risk factor for shunt failure.

Most intraoperative tools used to improve the accuracy of catheter insertion are time consuming and expensive or do not display the final position.

Coluccia et al evaluate the usefulness of intraoperative fluoroscopy to decrease catheter malpositioning, and define radiological landmarks to identify the correct localization.

A total of 104 patients undergoing ventriculoperitoneal shunt placement were analyzed for shunt position, revision surgery and outcome. The results for patients operated on using intraoperative biplanar fluoroscopic assessment of catheter location (X-ray group, n = 57) were compared with a control group operated without intraoperative radiography (control, n = 47). In order to generate a surgical reference map for intraoperative validation of shunt location, different ventricular system landmarks were defined on three-dimensional computed tomography reconstructions of hydrocephalic patients (n = 60) and exported to a two-dimensional layer of the skull.

The use of intraoperative X-ray imaging correlated with a significant increase of optimal catheter positions (X-ray group, n = 45, 79%; control group, n = 23, 49%; P = 0.0018). The sensitivity and positive predictive value for estimating an optimal shunt catheter position on biplanar imaging was 96% (95% confidence interval, 87%-99%). The specificity and negative predictive value were both 92% (95% confidence interval, 78%-98%).

Intraoperative fluoroscopy is easy to perform and is a reliable method to assess correct catheter positioning. Based on its predictive value, corrections of malpositioned ventricular catheters can be performed during the same procedure. The use of intraoperative fluoroscopy decreases early surgical revisions in ventriculoperitoneal shunt treatment [1)].

1)
Coluccia D, Anon J, Rossi F, Marbacher S, Fandino J, Berkmann S. Intraoperative Fluoroscopy for Ventriculoperitoneal Shunt Placement. World Neurosurg. 2016 Feb;86:71-8. doi: 10.1016/j.wneu.2015.08.072. Epub 2015 Sep 4. PubMed PMID: 26344633.

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