

Oral presentation

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The accuracy of ventricular catheter placement: does it influence shunt revision rates?

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Background

Ventricular catheter blockage is the commonest indication for shunt revision. Placement of a ventricular catheter in a region free of choroid plexus prolongs catheter survival. Positioning the tip of the ventricular catheter in the ipsilateral frontal horn anterior to the foramen of Munro is commonly considered the optimum position and is the standard position for catheter placement in our unit. Yet ventricular catheter placement is performed blindly and often misses the optimum position. In this study we aim to see how accurate we are in the placement of ventricular catheters and see whether the good positioning can reduce the rate of shunt revision.

Materials and methods

All ventricular catheters (i.e. VP shunts, external ventricular drains and Omay reservoir) inserted over a six-month period were studied prospectively. Adequacy of ventricular catheter placement was assessed on post-operative CT images. Information was recorded on the seniority of the surgeon, positioning of occipital burr holes and pre-operative ventricular size and time of day. Patients were followed up over 3 1/2 years using data from the UK Shunt Registry to determine rates of shunt revision with adequately placed and inadequately placed catheters in both frontal and occipital locations.

Results

187 catheters were placed in 184 patients. Post-operative imaging was available on 139 patients. Frontal catheters were adequately placed in 67% of cases; occipital catheters were adequate in 52%. Frontal catheters were frequently too long, whereas occipital catheters commonly crossed the midline. 43% of the burr holes were incorrectly positioned; this may improve with experience. When the burr hole was too lateral, the catheter position was inadequate in 90% cases. The revision rate for inadequately placed occipital catheters was far higher than adequately placed catheters (54% vs 15% at 140 weeks), yet there was no difference for the frontal catheters (50% vs. 44% at 140 weeks).

Conclusion

Occipital catheters are more difficult to place adequately than frontal catheters. The accuracy of placement of frontal catheters could improve if the depth of insertion could be better controlled. Occipital catheter placement is poor largely due to problems in placing the burr hole. The position of occipital catheters is more critical to shunt survival than frontal catheters.