

## Effect of Optimal Targeting of Ventricular Catheter with Intraoperative Computerized Tomography on Ventriculoperitoneal Shunt Revision

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### Introduction

Shunt dysfunction may lead to multiple reoperations, morbidities and financial loss. Significant portion of shunt dysfunction are due to the misplacement of ventricular catheters. The aim of this study is to investigate whether intraoperative CT usage has an effect on ventricular catheter targeting and shunt dysfunction.

### Methods

In our clinic, between 2008 and 2016, 274 patients who were operated for ventriculoperitoneal shunt insertion and who had control CT during hospitalization were retrospectively reviewed. These patients were operated for 349 times and for 317, intra or postoperative CT was done. In 146 cases (46.1%) intraoperative CT were performed.

We defined the optimal target as the catheter tip being located in the ipsilateral lateral ventricle frontal horn at least 1 cm deep from the ventricle entry point, maximally 1 cm posterior to the FM and not contacting ventricle wall.

### Results

In 23 cases (7.3%), ventricular catheter was repositioned before developing dysfunction because of their unacceptable localizations under the same general anesthesia. Of 146 cases with intraoperative CT, shunt dysfunction developed in 19 cases and in 40 of 171 cases with postoperative CT. After eliminating the other factors for V/P shunt dysfunction; 7 cases (5.2%) were identified in intraoperative CT group and 24 cases (15.6%) in postoperative CT group ( $p=0.07$ ). From the point of catheter tip localization, shunt dysfunction developed in 2 cases (1%) with optimal located catheter tip and in 29 cases (31.2%) with suboptimal located catheter tip ( $p=0.001$ ).

### Conclusions

Catheter tip location seems an important factor to avoid shunt dysfunction. Intraoperative CT helps to detect the catheter tip and to reposition it if necessary at the same operation.

### Learning Objectives

By the conclusion of this session, participants should be able to: 1) describe the optimal ventricular catheter target and importance of effect on dysfunction development 2) discuss the effect of intraoperative ct or any imaging technic to avoid dysfunction