Clinical Outcomes of Short-Term Subdural-Peritoneal Shunt for Progressive Subdural Fluid Collection in Children Less Than Four Years of Age, A Retrospective Case Series

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Introduction

A common and widely accepted method for treating subdural hematomas (SDHs) is the use of a subdural peritoneal shunt (SPS) to remove the excess fluid.

The current standard of care is removal of the shunt at 3-6 months. A previous study of twelve patients showed no complications or need for reinsertion of a shunt following this protocol of early removal (Kombogioras). Additionally, Morota has reported that fluid collections typically resolve within one month of a subdural peritoneal shunt placement.

Vinchon has reported an overall complication rate of 15.6% for subdural with 9% being related to obstruction, 3.28% being related to infection, and 3.28% being related to internal hydrocephalus.

Here we will present data demonstrating the efficacy of subdural-peritoneal shunt removal within 90 days of initial placement in children under four years of age.
Methods

An author performed SPS placement on 12 children under the age of four years old with traumatic SDHs.

These cases were retrospectively analyzed and isolated by CPT number from a local hospital database.

The records were analyzed to determine the incidence of obstruction, infection, and re-shunting in these patients, which could then be compared with respective incidence rates published by Vinchon et al. An exception is made for the incidence of re-shunting as no data was published by Vinchon et al.
Results

Among the 12 patients that were reviewed that had a time interval of less than 90 days between subdural shunt placement and subdural shunt removal, 0 patients developed an infection.

Among the 12 patients that were reviewed that had a time interval of less than 90 days between subdural shunt placement and subdural shunt removal, 0 patients developed obstruction.

Among the 12 patients that were reviewed that had a time interval of less than 90 days between subdural shunt placement and subdural shunt removal, 1 patient required manipulation of the shunt to relocate it from the parietal region to the frontotemporal region. However, there were no recorded shunt malfunctions and subsequently no need for shunt revision.
Follow up care was reviewed in these patients over a one-year period from the time of shunt placement.

Neurological impairment was varied and extensive in some cases, typically consistent with the documented degree of trauma and severity of the initial presentation.

7 of the 12 patients experienced no permanent neurologic impairment at the 12-month point.
Discussion

In light of these preliminary findings, we would advocate other centers to attempt subdural shunt removal within 90 days of subdural shunt placement follow traumatic brain injury in children under 4.

As referenced, non-complicated subdural fluid collections typically resolve within one month of placement of the subdural shunt, which further supports a removal time of less than 90 days.

At the time of presentation we are currently awaiting a second IRB that will significantly increase the sample size of our study as that is currently the underlying limitation to the power of the study.
Summary Points

• Following subdural shunt placement, subdural fluid collections typically resolve within one month in uncomplicated patients.

• Based on preliminary data, a subdural shunt removal time of less than 90 days may be appropriate for children less then 4 years of age following traumatic brain injury.

• Based on preliminary data, the incidence of infection, obstruction, and re-shunting does not appear to be statistically significantly different from published averages, though an expansion of this study will further clarify the statistical significance of these findings.