

Shuntcheck, A Non-invasive Device To Assess Ventricular Shunt Flow: One Institution'S Early Experience.

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Introduction

Hydrocephalus is a common neurosurgical problem often treated with ventriculoperitoneal shunt. Assessing shunt function involves clinical presentation, radiological findings and physical examination of the patient and the shunt reservoir, which often may include a shunt tap. ShuntCheck™ is an non-invasive transcutaneous thermal convection system that is used to detect cerebrospinal fluid (CSF) flow through shunts. In this study we have used ShuntCheck™ to evaluate patients with suspected shunt malfunction, and report our early findings.

Methods

Patients were screened per IRB protocol and enrolled in the study. Patients were evaluated with appropriate examination and radiological studies based on patient's history and presentation. ShuntCheck™ was used to assess shunt flow per trained protocol. Patients were followed for 7 days of the initial ShuntCheck™ test.

Results

Eight patients were enrolled in the study. Four of them had surgery to explore and revise the shunt; two had a ventricular catheter obstruction, two had poor flow through the valve or the peritoneal catheter. None of the patients had any adverse reactions to the ShuntCheck device. ShuntCheck accurately diagnosed poor flow in 100% of the operative cases. In one of the non-operative cases, ShuntCheck showed no flow, but a nuclear medicine study showed a patent shunt system.

Conclusions

Assessing patients for possible shunt malfunction involves a multimodal approach including clinical history, physical examination and radiological evaluation. ShuntCheck™ may prove a useful non-invasive tool to accurately assist in the shunt evaluation process, to help speed the diagnosis and potentially defer other more invasive diagnostic procedures.

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