Ramathibodi External Ventricular Drainage Collecting Device

Ake Hansasuta MD*, Nuttacha Chiannilkulchai BNS*

* Division of Neurological Surgery, Department of Surgery, Faculty of Medicine, Ramathibodi Hospital

The authors report the use of Ramathibodi External ventricular drainage (EVD) collecting device. It is made of previously-used medical items. The device costs 100 baht, compared to over 3,000 baht for those commercially available in Thailand. Over two hundred RAMA EVD collecting devices have been used with neurosurgical patients since 2002. Accurate cerebrospinal fluid (CSF) output measurement can be made with this device. Intracranial pressure monitoring is also possible. Because it is inexpensive and can be easily assembled, the authors recommend the RAMA EVD collecting device uses to other hospitals in Thailand.

Keywords: External ventricular drainage, EVD, Cerebrospinal fluid, CSF

Material and Method

The device is composed of many medical parts. The authors used a Soluset for a collecting chamber. This soluset was previously used for intravenous (I.V.) fluid administration. After sterilization, a previously used Soluset is connected to various components i.e. three-way connectors, silastic tubes, I.V. extension tubes and urinary leg bag. Step-by-step and detailed descriptions of its assembly can be found in Chiannilkulchai N et al (1). One important step in making the device is that the microdrip needle of the Soluset must be removed to allow CSF flow. This part is frequently clogged by CSF debris if not taken out. A picture of a complete RAMA EVD collecting device is shown in Fig. 1. Ethylene Oxide gas is used for sterilization of the entire device.

The RAMA EVD collecting device allows simple set up at an appropriate level of CSF drainage above external auditory meatus(2-4). The top of the Soluset chamber is placed at the desired level (Fig. 2). Hourly CSF output can be measured by reading the volume scale on the side of the Soluset. The authors recommend the use of this locally made device for CSF collection.
CSF can be drained into a urinary leg bag, connected to the bottom of the Soluset, if it is full (Fig. 2). It is recommended that the RAMA EVD collecting device be kept as a closed system due to increased risk of infection if opened. Upon patient’s transportation, it is recommended that the three-way be turned off so that no CSF may return into the ventricular catheter, if placed at a significant height.

**Results**

Since 2002, two hundred CSF collecting devices have been used. In small pediatric patients, closed CSF output monitoring for volume replacement can be achieved. EVD-related ventriculitis occurred in 18 patients, approximately 9% (18/200). Most of the infection was noted after seven days of EVD placement.

**Discussion**

For several years in Thailand, a transfusion bag has been used as CSF-collecting chamber. Although it is simple to connect with an EVD, CSF output volume has to be indirectly measured by weight. Inaccurate monitoring of volume loss may not be crucial in adult patients. However, this is significant in pediatric patients. The authors’ RAMA EVD collecting device provides more accurate CSF volume reading over the
อุปกรณ์เก็บและวัดปริมาตรน้ำไขสันหลังที่ดัดแปลงมาจากวัสดุใช้แล้วในโรงพยาบาลรามาธิบดี

เอก หังสสูต
ณัฎฐชา เจียรนิลกุลชัย

ผู้เขียนรายงานการใช้อุปกรณ์เก็บและวัดปริมาตรน้ำไขสันหลังที่ดัดแปลงมาจากวัสดุใช้แล้วในโรงพยาบาลรามาธิบดี ซึ่งมีผู้ป่วยผู้ป่วยที่มีภาวะเลือดสูงและภาวะระบบประสาทอื่น ๆ ได้โดยไม่มีความสัมพันธ์ การวัดปริมาตรน้ำไขสันหลังด้วยอุปกรณ์นี้ทำให้ดูความเปลี่ยนแปลงและมันย์ถือที่สำคัญเป็นอันเกี่ยวกับการตรวจวัดความดันในกะโหลกศีรษะโดยตัว

อุปกรณ์นี้มีราคาถูกและสามารถประกอบขึ้นเองได้โดยไม่มีความซับซ้อน ความตัวคุณค่าและแม่นยำอีกทั้งสามารถต่อเข้ากับเครื่องวัดความดันในกะโหลกศีรษะโดยตัว

RAMA EVD collecting device is simple to assemble. All of its components can be recycled and re-sterilized. Local hospitals in Thailand can make it by utilizing their previously-used items. The device costs about one hundred baht to make compared to over 3,000 baht of those brand-name collecting devices. At present, RAMA EVD collecting device is used in neurosurgical patients instead of the transfusion bag for CSF collection.

In summary, the authors suggest to hospitals in Thailand the use of the RAMA EVD collecting device because it is easy to assemble and is very economical.

References