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Percutaneous Transfontanellar External Ventricular Drainage in an Extremely Low Birth Weight Infant: 2-Dimensional Operative Video

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Manuscript type: Video Article

Title: Percutaneous Transfontanellar External Ventricular Drainage in an Extremely Low Birth Weight Infant: 2-Dimensional Operative Video

Running title: PTEVD in ELBW infants

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ABSTRACT

Intraventricular hemorrhage (IVH) and the subsequent development of post-hemorrhagic hydrocephalus (PHH) is one of the most serious complication of prematurity, especially in extremely low birth weight infants¹. Neuro-developmental delay, epilepsy and severe cognitive impairment represent common sequelae of PHH^{2,3}. A ventriculoperitoneal shunt (VPS) insertion in such premature infants is associated with higher rates of skin erosion, infection and shunt failure⁴. One therapeutic option is represented by the use of temporary cerebrospinal fluid (CSF) diversion procedures (such as external ventricular drainage, subcutaneous reservoir and ventriculosubgaleal shunt) to gain time avoiding the PHH secondary damages^{5,6}.

An extremely low birth weight (BW=653 g) infant at 24+4 gestational age weeks presented with a grade III IVH and peri-ventricular hemorrhagic infarction five days after birth. Serial transfontanellar ultrasound (US) disclosed a progressive PHH. Progressive symptomatic PHH, pulmonary hemodynamic instability and suboptimal general prematurity conditions were the main factors that led to plan a percutaneous transfontanellar US-guided EVD at the neonatal intensive care unit. The illustrated procedure represents a bedside minimally invasive, effective, reversible and sparing-time choice alternative to other temporary CSF diversion techniques.

This edited, 2-dimensional operative video highlights the surgical key steps of the proposed procedure (Video 1). All relevant patient identifiers have been removed from the video. Nevertheless, parent's consent was obtained regarding the procedure, video recording and redistribution for educational purposes.

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1 **Abbreviations:**

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3 BW, birth weight

4 CSF, cerebrospinal fluid

5 ELBW, extremely low birth weight

6 EVD, external ventricular drainage

7 IVH, intraventricular hemorrhage

8 PHH, post-hemorrhagic hydrocephalus

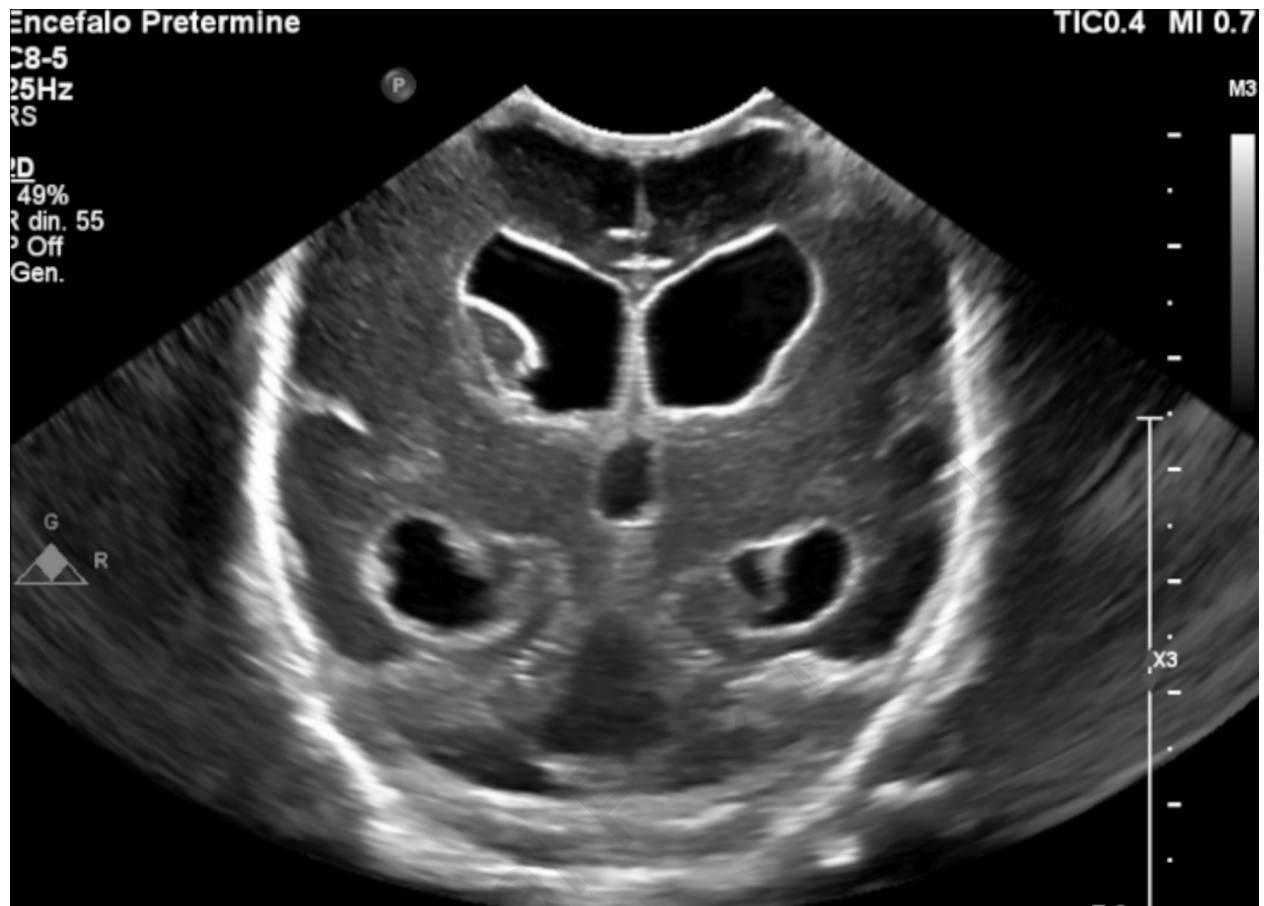
9 PTEVD, percutaneous transfontanellar external ventricular drainage

10 US, ultrasound

11 VPS, ventriculoperitoneal shunt

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