Endoscopic third ventriculostomy success score

Kulkarni et al., ^{1) 2)} developed and internally validated the Endoscopic third ventriculostomy (ETV) Success Score (ETVSS)-a simplified means of predicting the 6-month success rate of endoscopic third ventriculostomy (ETV) for a child with hydrocephalus, based on age, etiology of hydrocephalus, and presence of a previous shunt. A high ETVSS predicts a high chance of early ETV success.

Variable	ETVSS					
	0	10	20	30	40	50
Age	<1 mo	1 mo to <6 mos		6 mos to <1 yr	1 yr to <10 yrs	≥10 yrs
Etiology	Postinfectious		Myelomeningocele, IVH, nontectal brain tumor	Aqueductal stenosis, tec- tal tumor, other eti- ology		
Previous shunt	Yes	No				

Across all ETVSS strata, the risk of ETV failure becomes progressively lower compared with the risk of shunt failure with increasing time from the surgery. In the best ETV candidates (ETVSS \geq 80), however, the risk of ETV failure is lower than the risk of shunt failure very soon after surgery, while for less-than-ideal ETV candidates (ETVSS \leq 70), the risk of ETV failure is initially higher than the risk of shunt failure and only becomes lower after 3-6 months from surgery. These results need to be confirmed by larger, prospective, and preferably randomized studies ³.

The success of ETV in the series of García et al., could have been predicted by ETVSS ⁴.

Prospectively collected data on all ETV procedures with the Republic of Ireland in children \leq 16 years of age, totalling 112, from 2008 to 2014 was analysed. The percentage chance of success at six months was retrospectively calculated according to the ETVSS. A multivariable model, comprising the risk factors from the ETVSS - age, aetiology and previous shunt - was created and its performance compared to that of the ETVSS.

The ETVSS achieved an AUC of 0.61 (95% CI: 0.49-0.71) with a sensitivity and specificity of 50% and 76%, respectively, at its optimal cutoff. The ETVSS was not significantly well calibrated in this cohort and there was a limited net benefit on decision curve analysis in comparison with the strategy of performing ETV in all patients. The multivariable model achieved an AUC of 0.67 (95% CI: 0.56-0.78), was well calibrated and was associated with a superior net benefit over that of the ETVSS.

The ETVSS represents the future of patient risk stratification with an easy to use, individualised approach for each patient. The ETVSS has performed adequately in this study. However, through the addition of novel risk factors, the continuous updating of the model and recalibration where needed, the ETVSS can become a tool that the paediatric neurosurgeon cannot do without ⁵⁾.

1)

Kulkarni AV, Drake JM, Mallucci CL, et al.Endoscopic third ventriculostomy in the treatment of

childhood hydrocephalus. J Pediatr. 2009; 155: 254-9 e1

2)

Kulkarni AV, Drake JM, Kestle JR, et al. Predicting who will benefit from endoscopic third ventriculostomy compared with shunt insertion in childhood hydrocephalus using the ETV Success Score. J Neurosurg Pediatr. 2010; 6:310–315

Kulkarni AV, Drake JM, Kestle JR, Mallucci CL, Sgouros S, Constantini S; Canadian Pediatric Neurosurgery Study Group. Predicting who will benefit from endoscopic third ventriculostomy compared with shunt insertion in childhood hydrocephalus using the ETV Success Score. J Neurosurg Pediatr. 2010 Oct;6(4):310-5. doi: 10.3171/2010.8.PEDS103. Erratum in: J Neurosurg Pediatr. 2011 Feb;7(2):221. J Neurosurg Pediatr. 2011 Feb;7(2):221. PubMed PMID: 20887100.

García LG, López BR, Botella GI, Páez MD, da Rosa SP, Rius F, Sánchez MA. Endoscopic Third Ventriculostomy Success Score (ETVSS) predicting success in a series of 50 pediatric patients. Are the outcomes of our patients predictable? Childs Nerv Syst. 2012 Aug;28(8):1157-62. doi: 10.1007/s00381-012-1836-3. Epub 2012 Jun 17. PubMed PMID: 22706984.

Foley RW, Ndoro S, Crimmins D, Caird J. Is the endoscopic third ventriculostomy success score an appropriate tool to inform clinical decision-making? Br J Neurosurg. 2016 Sep 14:1-6. [Epub ahead of print] PubMed PMID: 27624099.

