LUMBAR PUNCTURE IN THE MANAGEMENT OF POSTOPERATIVE CEREBROSPINAL FLUID (CSF) LEAKS FOLLOWING ENDOSCOPIC THIRDVENTRICULOSTOMY.

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ABSTRACT

Introduction: *Endoscopic third ventriculostomy (ETV) has become an established treatment for obstructive hydrocephalus. Success and failure criteria are, sometimes, debatable.*

Postoperative cerebrospinal fluid (CSF) wound leak is considered, by most, a clinical criterion of failure subsequently recommending revision surgery or shunt implantation.

Aim of Work: *to elucidate the impact of repeated lumbar puncture for postoperative CSF wound drainage on the final ETV outcome*

Patients and Methods: *From a prospectively maintained registry of endoscopic ventricular surgery; clinical, radiographic and, operative data are compiled to calculate the ETV success score and an intraoperative score. Patients with symptomatic postoperative wound collection and/or CSF leak were identified and managed by repeated lumbar punctures. Clinical and imaging follow up was established to evaluate final outcome.*

Results: *From a total of 75 patients with endoscopic interventions for hydrocephalus, 57 patients underwent ETV. Fifteen patients (26%) had postoperative CSF leak and/or wound bulge requiring a median of 3 lumbar punctures. This group had a mean ETV success score of 61 and a favorable intraoperative score in 93% of the cases. The scores were not different from those of the whole cohort. Repeated lumbar puncture was successful in 7 out 15 patients (47%). The difference between patients with successful and failed serial lumbar punctures in both the ETV success score and intraoperative score was not statistically significant.*

Conclusion: *Partaking serial lumbar punctures in patients with CSF wound drainage or signs of potential ETV failure in the early postoperative period was successful in half of the instances. This could be recommended in presence of favorable ETV success score andintraoperative score to avoid premature shunting.*

Key words: *• Lumbar puncture • Cerebrospinal fluid leak • endoscopic thirdventriculostomy • hydrocephalus.*

INTRODUCTION:

The practice of endoscopic third ventriculostomy (ETV) has lately evolved as a valid and dependable treatment method for obstructive hydrocephalus. The shunt independence and the minimization of procedural risk are the key factors for its increasing popularity.[1–6] Criteria for success/failure are often debatable and postoperative cerebrospinal fluid (CSF) wound leak is considered in many instances a clinical indicator of early failure. This is usually followed by a decision of ETV revision or placing a ventricular shunt. The counter argument is that relying on this clinical sign only would result in a false high rate of early ETV failure because slow ETV response is observed sometimes and that improvement ensues with established absorptive capacity of the subarachnoid space (SAS)[7–11]. During this period of so-called, symptomatic adaptation, there might be manifestations of increased intracranial pressure (ICP) or progressive ventricular enlargement or even, CSF wound drainage. Yet, reports of transient or reversible nature of such early postoperative manifestations following ETV do exist.

In this study, the authors wish to elucidate the impact of repeated lumbar puncture for postoperative CSF wound drainage on the final ETV outcome.

PATIENTS AND METHODS:

A prospective registry is maintained for patients undergoing endoscopic ventricular surgery at Ain Shams University hospitals. Clinical presentation, radiographic information, operative details and postoperative course are documented. For patients undergoing ventriculostomy, ETV success score [12, 13] and intraoperative score (devised by the Cornell group) [14] are calculated for each patient. Endoscopic third ventriculostomy is done in the standard fashion using a rigid scope (diameter 6.8-mm; Lotta system, Storz and Co., Tuttlingen, Germany). Patients with post-operative wound bulge and/or CSF wound drainage were identified and managed with serial lumbar punctures (LPs) to control the clinical manifestations. Upon introduction of the spinal needle, no negative pressure was applied, and it was allowed to drain spontaneously. Patients with stable or progressive leak, having progressive intracranial pressure (ICP) symptoms with consistent imaging findings (lack of flow across the ventriculostomy in flow-studies, progressive ventricular enlargement or brain parenchymal compression/permeation) were considered to have definitive ETV failure. Conversely, those with regressive CSF leak and improvement of the ICP symptoms were considered successful.

No pre-set number of attempts for lumbar puncture was established.

Ethical approval to conduct the study was obtained from the local Institutional reviewboard.

RESULTS:

Starting from August 2015, 75 patients had endoscopic interventions for hydrocephalus, among them; 57 ETV patients were identified. Male-to-female ratio was 1.19 and mean age was 11 years. Predominant etiology was aqueduct stenosis (44%) and it was present on the imaging of 56% of the patients (Figure 1). ETV success score (ETVSS) for the whole cohort ranged 20-90 with a mean of 66, median 70 (Table 1). Fifteen patients (26.3%) were identified for whom lumbar puncture was done to control postoperative CSF leak, wound bulge or ICP manifestations (in only 1 patient without wound leak). Around 10-30 ml of CSF were drained with each lumbar puncture or until the CSF drainage became obviously slow. In children with open anterior fontanel, it was noted that the fontanel comes down with drainage and the wound collection (if present) was also decompressed. The mean ETVSS for such patients was 61 (median 60) and intraoperative score was 0 (favorable) in 10 patients (67%) with only 4 patients having a less favorable intraoperative score (i.e. 1) and 1 patient with unfavorable score (i.e. 2). In 7 patients **(46.7%)**, control of the postoperative CSF leak was achieved with

1-5 times of lumbar puncture (median 3 times). Those patients are considered LP-successful group. The remaining 8 patients **(53.3%)** required revision of the CSF diversion procedure (7 with ventricular shunt and 1 with ETV) i.e. LP-failure group. The patient who underwent ETV revision, maintained good clinical and radiographic outcome for a follow up period of 30 months. One patient in the LP-successful group presented to an outside institution with radiographic and clinical signs of failure, 7 months postoperative and she unfortunately died from untimely management of acute hydrocephalus (Table 2).

This results in a final number of 7 patients **(46.7%)** who had repeated LPs and remained *shunt-free* (6 patients without revision procedure and one patient with ETV revision), during a mean follow period of 27.6 months (median 27 months). In the LP-failure group (n=8), mean Time-to-failure (TTF) was 1.4 months (median 1 month). (Figure 2).

Table 1: Basic characteristics of the ETV patient cohort (n= 57)

Age	Range (14 days – 71 years) Mean= 11 years Median= 18 years
Male FemaleM: F	N= 31 N= 26 1.19
Etiology *Aqueduct stenosis Tumor related DWV/BPC**	n= 24 (43.9%) n= 10 (17.5%) n= 9 (15.8%)
DWM*, thalamic AVM, post-infectious	n= 9 (15.8%) (2 patients with DWM and 1 patient with post-infectious etiology had aqueduct stenosison imaging)
Chiari type 2	n= 5 (8.8%) (4 patients with Chiari type 2 hadaqueduct stenosis on imaging)
ETVSS	Range = 20 - 90 Mean = 66 Median = 70
intraoperative score † *score 0* *score 1* *score 2* *score 3*	mode = 0 n= 39 (69.6%) n= 11 (19.6%) n= 3 (5.4%) n= 3 (5.4%)
Follow up	Mean= 15 months Median = 11 months Range= 0.5-60 months ETV success in established follow up (31/47) = 66% ‡

*DWM: Dandy Walker Malformation, DWV: Dandy Walker Variant, BPC: persistent Blake'spouch cyst

†One patient excluded from the total, aborted procedure for intraoperative bleeding *‡These patients with established follow up had the same mean and median ETVSS of 66 and 70 respectively as the whole cohort*

N, n: number of patients

Table 2: Characteristics of patients with postoperative CSF wound drainage (n=15)

Age	Range (1.5 months – 30 years) Mean= 5.3 years Median= 9 months	**Compared to patientswithout leak** *p*= 0.119 (Kruskal-Wallis test)
ETVSS	Range = 40 – 90 **Mean= 61** **Median= 60**	*p*= 0.21 (unpairedstudent-*t* test)
Intraoperative	**Mode = 0**	
score		
Score 0	n= 10 **(66.7%)**	
Score 1	n= 4 **(26.7%)**	
Score 2	n= 1**(6.7)**	
Score 3	n= 0	
Number of LPs*	Range= 1-5 Mean= 2.6 times Median 3 Mode= 1 *(30% of the cases)*	
	LP-successful group (n= 7)	**LP-failure group (n=8)**
ETVSS	Mean= 60 Median= 60	Mean= 62.5 Median= 60
	Difference *p*= 0.75 (unpaired student-*t* test)	
Intraoperative score	Favorable score (0,1) n =7	Favorable score (0,1) n= 7
	Difference *p*= *0.61 (Fisher's exact test)*	

*LPs: lumbar punctures N, n: number of patients

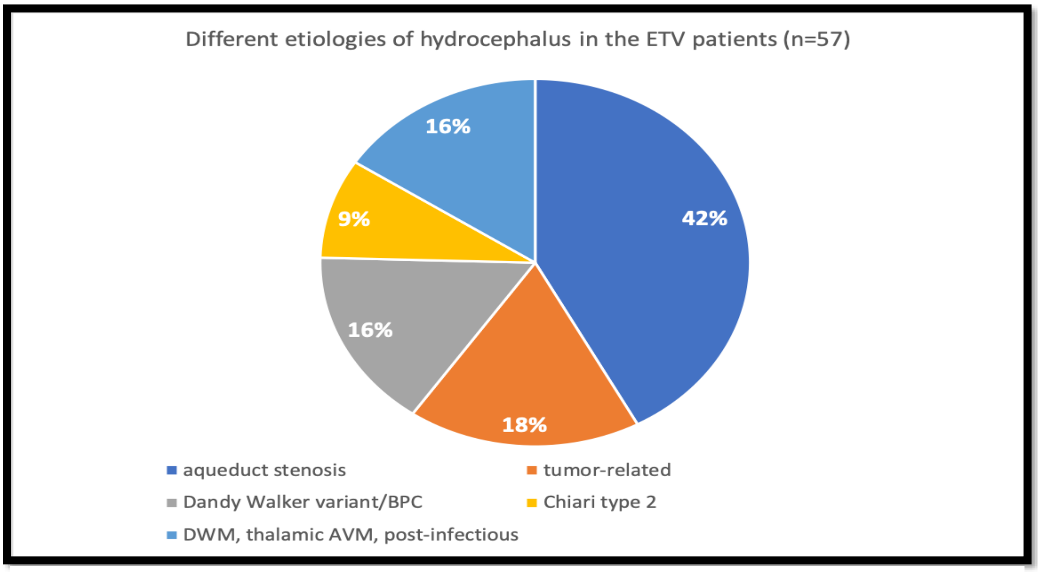

Figure 1: different etiologies of hydrocephalus for

BPC: persistent Blake's pouch cyst DWM: Dandy Walker Malformation AVM: Arterio-venous Malformation

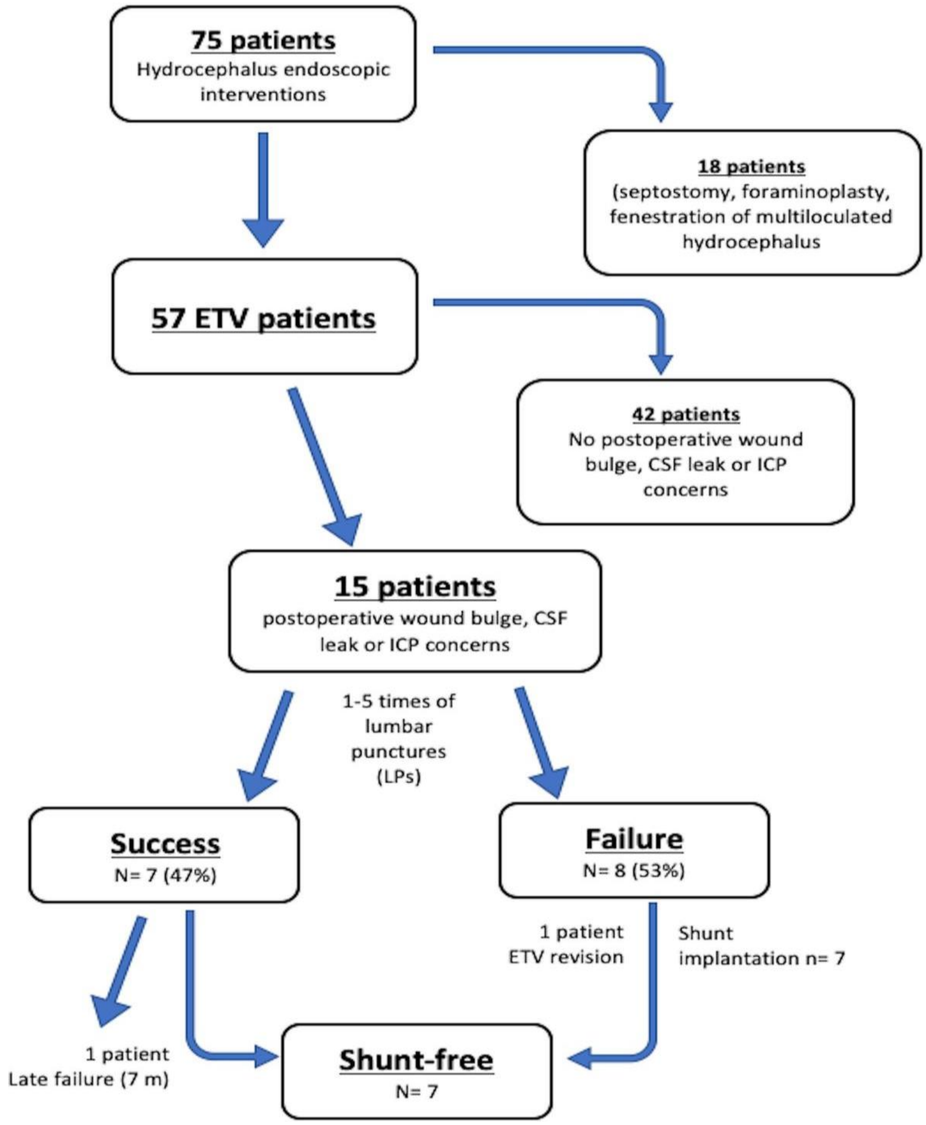

Figure 2: flow diagram describing the interventions done for the patients, group and subgroup classification and final outcome.

Upon comparing the scores of the 2 groups, the LP-successful group had a mean ETVSS of 60 (median 60) and intraoperative score (mode 0). The LP-failure group had a mean ETVSS of 62.5 (median 60) and intraoperative score (mode 0). The difference between the 2 groups was not statistically significant (*p*= 0.745, unpaired student-*t* test, *p*= 0.61 Fisher's exact test). The patients receiving higher intraoperative score of both groups were predominantly due to the presence of scarred membranes in the prepontine cistern.

When compared to the patients without postoperative wound bulge or CSF drainage (mean and median ETVSS 66 and 70 respectively), there was no significant difference *(p= 0.21*, unpaired student-*t* test), from the patients with postoperative CSF leak. (Figure 3)

Over a mean follow up duration of 15 months (median 11 months), success rate in the whole cohort was 66% after exclusion of 10 patients (5 patients lost to follow up, 2 patients with short time from surgery and 3 postoperative mortalities).

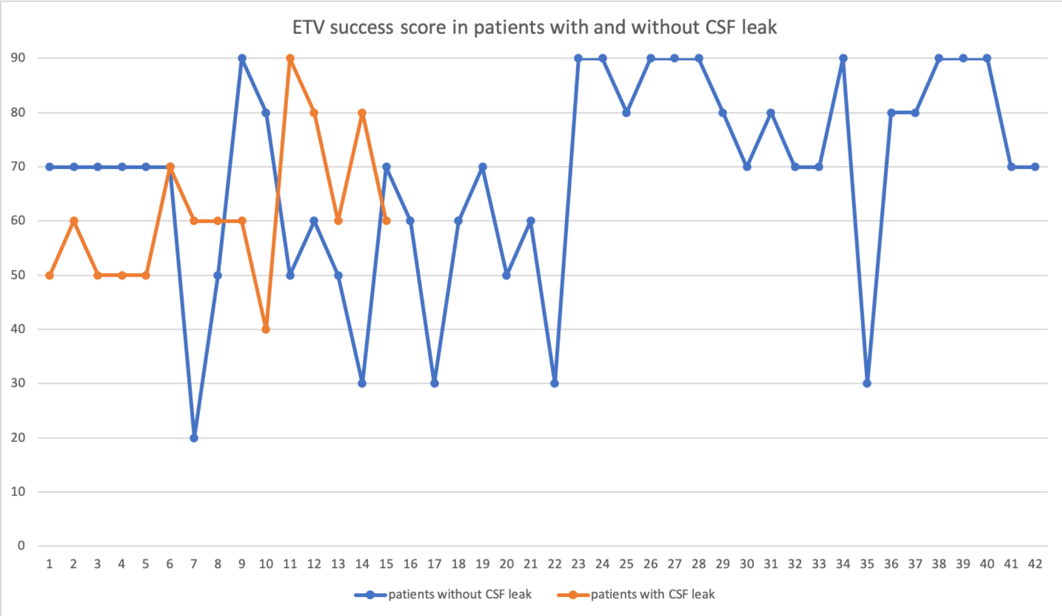

Figure 3: Distribution of the values of the ETV success score (ETVSS) between the patients with postoperative CSF leak (n= 15) and those with no leak (n= 42)

DISCUSSION:

With the expansion of the practice of endoscopic third ventriculostomy (ETV), certain technical and clinical nuances come to recognition; especially in institutions with high volume practice.[1, 2] Criteria for success/failure are often debatable accounting for the highly variable success rate reported in literature. [8, 15, 16, 17]

Pathophysiology of CSF leak following ETV:

Postoperative CSF leak is largely regarded a clinical sign of ETV failure necessitating revision or ventricular shunt insertion. Anecdotally, endoscopic experts advised repeated lumbar punctures (LPs) to help mitigate CSF leak based on the logical assumption that the ventriculostomy has established a communication between the ventricles and subarachnoid space (SAS). In other words, hydrocephalus is converted from ***an obstructive*** to ***acommunicating*** form and tapping the lumbar SAS might help. Postoperative CSF wound drainage following ETV is regarded, in such context as manifestation of increased ICP and/or increased resistance to the CSF flow from the ventricles through the formed stoma into the basal cisterns. Subsequently, the CSF finds its way through the path of least resistance i.e. the cortical path formed by the endoscope.

Adaptation period and absorption lag:

Endoscopic third ventriculostomy often rapidly alleviates the symptoms of raised ICP in patients with obstructive hydrocephalus. However, in some cases, symptoms can persist or recur in the early postoperative period. This was sometimes referred to as "adaptation

period" [18,19, 8] Following ETV, ICP might increase after a few days and then gradually decline.[20, 8, 18, 11] Although the cause of this phenomenon is not definitively known, part of the reason is that the SAS may not be fully receptive to the excess CSF reaching by virtue of the third ventriculostomy. This may also be due to the reduced permeability of arachnoid granulations (AGs). A long period of obstruction, with less than normal CSF reaching them, will cause AGs to be idle, which leads to CSF absorption dysfunction. Therefore, lumbar puncture, by reducing CSF volume, helps in the functional AG recovery.[9, 21]

In their large case series, Cinalli and colleagues [8] monitored the intracranial pressure (ICP) in patients undergoing ETV showing two patterns during the "adaptation period". They had a group (53% of the cohort), where ICP was immediately normal (20 mmHg), and remained normal for all the duration of the monitoring. This group included most patients with shunt malfunction in the cohort (78%) and half (48%) of children with primary presentation. The other group (47% of the cohort) showed immediately high ICP or on the second postoperative day which decreased slowly in the subsequent days. In this second group (high ICP), some patients had clinical manifestations and occasionally coupled with imaging that showed increasing dilatation of the ventricular system thus, adding further evidence of failure. In 20 patients of this group, the authors performed an average of 3 LPs that were effective in normalization of the ICP and most of those patients ultimately did not require a shunt. Subsequently, they recommended: ***"A cycle of one to three lumbar punctures should always be performed in patients who remain symptomatic and who show increasing ventricular dilatation after ETV, before ETV is assumed to have failed and an extracranial cerebrospinal fluid shunt is implanted."*** This is consistent with the numbers in the current study; with a median of 3 LPs done for the symptomatic patients before classifying them to LP-successful and LP-failure groups. These groups were similar in ETVSS and intraoperative scores and subsequently, there was no way to dichotomize such patients into potential failure and success without undertaking the lumbar puncture. This is supported by observation that LP-failure group contributed 50% of total failure rate in the whole cohort (8 out 16) while the LP-successful group contributed 6.3% of final failure rate (1 out of 16). *In other words, the postoperative lumbar puncture protocol for symptomatic patients helped discern definitive from potential failures in the early postoperative period.*

Postoperative lumbar drainage or lumbar punctures:

Watkins J. [22] reported a series of adult patients where ETV was combined with ***routine*** postoperative placement of a lumbar drain. The authors reported a success rate of 83.3% which they described as higher than expected based on the ETV success scores (ETVSS) of the cohort i.e. 71.8%. They attributed this to the effect of the lumbar drain in the early postoperative period.

A remarkably high success rate (81.8%) was reported by Constantini et. al[23] employing ***continuous*** lumbar drainage on selective (non-routine) basis. The authors inserted lumbar drains in instances of high measured ICP, clinical manifestations of increased ICP and in patients with intraoperative complications or preoperative status raising suspicion of poor absorptive capacity of the subarachnoid space (SAS) e.g. multiple shunt failures or redo ETV. The lumbar drains were kept for an average of 7 days of drainage and ICP monitoring. They concluded that lumbar drainage in select subsets of ETV patients is a reasonable method to gain time allowing recovery of the absorptive capacity following ETV.

In the present study, a quarter of our patients developed postoperative CSF bulge/leak. Given that half of such patients improved with repeated LPs and did not require shunting, they are thus worth the LP trial allowing time and chance for buildup of absorptive capacity before regarding them as ETV failure and opt for shunting. This strategy contributed to the final success rate of 66% in the whole cohort. Otherwise, acting upon postoperative CSF leak as a sign of early failure, would have resulted in 54% success.

Routine lumbar puncture was also performed by Zhiqiang Hu and colleagues following ETV on 145 patients.[9] They identified a subset (n=39) of patients who were symptomatic with high ICP readings. For those patients, total of 6 lumbar punctures were performed to help normalize ICP. Normal readings were achieved by postoperative day 11 and this management strategy helped avoid permanent shunt insertion in 89.7% of the high ICP patients.

In the current study, routine lumbar puncture was not performed in the postoperative period. This was applied to only those who were clinically symptomatic enough and could be regarded as potential early ETV failure. It is intuitive to assume that more patients with high ICP were adapting well, not showing clinical signs and went on to have a successful ETV. Only those with considerable absorption lag and ICP high enough to manifest received the lumbar puncture. This might explain the lower (46.7%) success rate in such patients compared to the reports employing routine lumbar puncture or continuous drainage.

The role of lumbar puncture following ETV:

Theories predominate the role of lumbar puncture in such situations. It is postulated that LP helps in faster normalization of intracranial pressure by increasing the compliance and, as stated above, the buffering capacities of spinal subarachnoid space (SAS) which may promote arachnoid granulations (AGs) to open subsequently increasing the CSF absorption. It might also help by reducing the CSF pressure in the SAS thereby decreasing the resistance for CSF flow between the ventricular system and the SAS. In that sense, the CSF can enter the SAS freely through the stoma, resulting in restoration of CSF circulation. Reduction in CSF pressure results in reduced ventricle size and volume, thus improving hydrocephalus and ICP symptoms.[8,9,21,23,24]

In our series, we demonstrated that serial lumbar punctures were successful to alleviate the symptoms in almost half of the patients with postoperative CSF leak following ETV. Such patients were shunt-free for a mean follow up of over 2 years demonstrating durability of the intervention. The lack of statistical difference in ETV success score between patients with and without postoperative CSF leak is encouraging as it indicates that patients with leak stand the same preoperative prediction of success, so rushing for shunt implantation in such patients should be considered with caution.

To the best of our knowledge, this is the first description of post-ventriculostomy CSF wound drainage/ICP concerns in relation to the specific preoperative and intraoperative findings (ETVSS and intraoperative score). Based on the current findings, we strongly recommend partaking serial LPs in patients with early CSF wound drainage or signs of potential early ETV failure based on preoperative prediction of success and favorable intraoperative findings.

Conclusion:

Consistent with limited reports in literature, the current data suggest that lumbar puncture in the early postoperative period following ETV; can be utilized as a form of bridging therapy during a lengthy or symptomatic “adaptation period”. This helps avoid permanent CSF diversion with shunts and is probably applicable in patients with moderate ETV success score in the presence of a favorable intraoperative score.

Conflicts of Interest: The authors state that the publishing of this paper is free of any conflicts of interest.

REFERENCES:

1. Bouras T, Sgouros S. Complications of Endoscopic Third Ventriculostomy : *Acta Neurochir Suppl*. 2012;113:149-153. doi:10.1007/978-3-7091-0923-6
2. Drake JM, Rutka JT, Dirks P, et al. Endoscopic third ventriculostomy in pediatricpatients: The Canadian experience. *Neurosurgery*. 2007;60(5):881-885. doi: 10.1227/01.NEU.0000255420.78431.E7
3. Greitz D. Paradigm shift in hydrocephalus research in legacy of Dandy ' s pioneering work : rationale for third ventriculostomy in communicating hydrocephalus. *Childs Nerv Syst*. 2007;23:487-489. doi:10.1007/s00381-007-0303-z
4. Peretta P, Ruggiero C, Cinalli G, et al. Long-term results of a second endoscopic third ventriculostomy in children: Retrospective analysis of 40 cases. *Neurosurgery*. 2009;65(3):539-547. doi: 10.1227/01.NEU.0000350228.08523.D1
5. Teo C, Jones R. Management of hydro-cephalus by endoscopic third ventriculo-stomy in patients with myelomeningocele. *Pediatr Neurosurg*. 1996;25(2):57-63. doi:10.1159/000121098
6. Vogel TW, Bahuleyan B, Robinson S, Cohen AR. The role of endoscopic third ventriculostomy in the treatment of hydrocephalus Clinical article. *J Neurosurg Pediatr*. 2013; 12(1):54-61. doi:10.3171/ 2013. 4.PEDS12481
7. Elgamal EA. Continuous monitoring of intracranial pressure after endoscopic third ventriculostomy in the management of CSF shunt failure. *Minim Invasive Neurosurg*. 2010; 53(2): 49-54. doi:10.1055/s-0030-1249101.
8. Cinalli G, Spennato P, Ruggiero C, et al. Intracranial pressure monitoring and lumbar puncture after endoscopic third ventri-culostomy in children. *Neurosurgery*. 2006;58(1):126-134. doi:10.1227/01.NEU. 0000195972.48670.86
9. Hu Z, Kang Z, Zhu G, et al. Experience with Lumbar Puncture Following Endoscopic Third Ventriculostomy for Obstructive Hydrocephalus. *J Neurol Surgery, Part A CentEur Neurosurg*. 2017; 78(2): 132-136. doi: 10.1055/s-0035-1564050
10. Matson D. Neurosurgery of infancy and childhood. In: Thomas CC, ed. Edition 2. Springfield; 1969:240.
11. Nishiyama K, Mori H, Tanaka R. Changes in cerebrospinal fluid hydrodynamics following endoscopic third ventriculostomy for shunt-dependent noncommunicating hydrocephalus. *J Neurosurg*. 2003;98(5): 1027-1031. doi:10.3171/jns.2003.98.5.1027
12. Kulkarni A V., Drake JM, Mallucci CL, Sgouros S, Roth J, Constantini S. Endoscopic Third Ventriculostomy in the Treatment of Childhood Hydrocephalus. *J Pediatr*. 2009;155(2):254-259.e1. doi:10. 1016/j.jpeds.2009.02.048
13. Kulkarni A V., Drake JM, Kestle JRW, et al. Predicting who will benefit from endoscopic third ventriculostomy compared with shunt insertion in childhood hydrocephalus using the ETV success score: Clinical article. *J Neurosurg Pediatr*. 2010; 6(4): 310-315. doi:10.3171/2010.8. PEDS103
14. Greenfield JP, Hoffman C, Kuo E, Christos PJ, Souweidane MM. Intraoperative assess-ment of endoscopic third ventriculostomy success. *J Neurosurg Pediatr*. 2008; 2(November): 298-303. doi:10.3171/PED. 2008.2.11.298
15. Javadpour M, Mallucci C, Brodbelt A, Golash A, May P. The impact of endoscopic third ventriculostomy on the management of newly diagnosed hydrocephalus in infants. *Pediatr Neurosurg*. 2001;35(3):131-135. doi:10. 1159/000050406
16. Kulkarni A V., Riva-Cambrin J, Browd SR. Use of the ETV Success Score to explain the variation in reported endoscopic third ventriculostomy success rates among published case series of childhood hydrocephalus. *J Neurosurg Pediatr*. 2011;7(2):143-146. doi:10.3171/2010. 11.

PEDS10296.

17. Fritsch MJ, Mehdorn M. Endoscopic intraventricular surgery for treatment of hydrocephalus and loculated CSF space in children less than one year of age. *Pediatr Neurosurg*. 2002;36(4):183-188. doi:10. 1159/000056055

18. Rapanà A, Bellotti A, Iaccarino C, Pascale M, Schönauer M, Kulkarni A. Intracranial pressure patterns after endoscopic third ventriculostomy. Preliminary experience. *Acta Neurochir (Wien)*. 2004;146(12):1309-1315. doi:10.1007/s00701-004-0377-2

19. Bellotti A, Rapana A, Iaccarino C, Schonauer M. Intracranial pressure monitoring after endoscopic third ventriculostomy: an effective method to manage the 'adaptation period .' *J Clin Neurol Neurosurg*. 2001;103(4):223-227.

20. Frim DM, Goumnerova LC. Telemetric Intraventricular Pressure Measurements after Third Ventriculocisternostomy in a Patient with Noncommunicating Hydrocephalus. *Neurosurgery*. 1997;41(6): 1425-1429. doi:10.1097/00006123-199712000-00044

21. Cartmill M, Vloeberghs M. The fate of the cerebrospinal fluid after neuroendoscopic third ventriculostomy. *Child's Nerv Syst*. 2000; 16 (12): 879-881. doi:10.1007/ s003810000373

22. Watkins J, Cabanne M, Miulli D. Markedly Improved Success Rate of Endoscopically Assisted Third Ventriculostomy Is Achieved by Routine Placement of External LumbarDrain. Published online 2017.

23. Ozisik P, Roth J, Beni-Adani L, Constantini S. Continuous spinal drain following endoscopic third ventriculostomy: A proposal to change the definition of failure. *Child's Nerv Syst*. 2011;27(11):1973-1978. doi:10.1007/s00381-011-1562-2

24. Bech-Azeddine R, Nielsen OA, Løgager VB, Juhler M. Lumbar elastance and resistance to CSF outflow correlated to patency of the cranial subarachnoid space and clinical outcome of endoscopic third ventriculostomy in obstructive hydrocephalus. *Minim Invasive Neurosurg*. 2007;50(4):189-194. doi:10.1055/s-2007-985890.

دور البزل القطني في علاج تسرب السائل النخاعي مابعد جراحة فغر البطين الثالثبالمنظار

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المقدمة: أصبح فغر البطين الثالث بالمنظار الجراحي حلاً جيداًلعلاج استسقاء الرأس الانسدادي. معايير النجاح والفشل ، في بعض الأحيان ، قابلة للنقاش. يعتبر تسرب السائل الدماغي النخاعي بعد العملية الجراحية ، في الغالب ، معيارًا سريريًا للفشل ، ويوصي بعد ذلك بإجراء جراحة مراجعة للمنظار أو تركيب صمام مخي.

بحث سريري اكلينيكي للوصول لمعايير واضحة لرفع كفاءة التدخلات الجراحية بالمنظار في علاج حالات استسقاء بطينات المخ

هدف العمل: توضيح تأثير البزل القطني المتكرر لعلاج تسريب السائل النخاعي من الجرح بعد الجراحة على النتيجة النهائية لـعلاج الحالات بالمنظار

المرضى ووسائل البحث:يتم التسجيل الموضوعي لكل حالات جراحة البطينبالمنظار ؛ يتم تجميع البيانات السريرية والشعاعية والتشغيلية لحساب درجة نجاحالجراحة.

النتائج: من إجمالي ٧٥ مريضًا خضعوا لتدخلات علاج بالمنظار لاستسقاء الرأس ، خضع ٥٧ مريضًا لـفغر البطين الثالث. خمسة عشر مريضا (٢٦ ٪) لديهم تسرب للسائل النخاعي بعد الجراحة و / أو انتفاخ الجرح الذي يتطلب متوسط ٣ مرات بزل قطني. كان البزل القطني المتكرر ناجحًا في ٧ من ١٥ مريضًا (٤٧٪).

الخلاصة: إجراء ثقوب قطنية متسلسلة في المرضى الذين يعانون من تسريب السائل النخاعي من الجرح كان ناجحًا في نصف الحالات. يمكن التوصية بهذا في وجود درجة نجاح للتدخل بالمنظار مواتية