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Assesment Outcome of Endoscopic Third Ventriclulostomy of Treatment of Hydrocephalus in Iraq by Section Study

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Abstract: **Background**: Endoscopic third ventriculostomy (ETV) is being proved to be a safe and efficient therapy for many Etiologies of hydrocephalus. There is evidence that younger age is indicative underlying a worse outcome following ETV in children, and some data on the role in hydrocephalus etiology for outcomes after ETV. **Aim:** This paper aims to assess the outcomes of Endoscopic Third Ventriculostomy to treatment Endoscopic Third Ventriculostomy in Iraq by section study. **Methodology of the study:** This study was conducted some examinations on the ETV data to determine a cross-sectional study on the treatment of endoscopic third ventriculostomy in Iraq by section study where it focused on endoscopic third ventriculostomy patients with ages older than 18 to 50 years. In the methodology of data designs, our data was distributed with 132 patients, which where it divided into two groups, which are the first group presents 66 cases, and the second group presents 66 cases. Our study was collected data from different hospitals in Iraq between 16th July 2021 to 25th August 2022. This data was designed and analysed by the SPSS program. **Discussion:** Our paper found that CSF leaks are the most prevalent immediate post-operative complication with ETV and are caused in part by the raised intraventricular pressure, which prevails immediately following surgery. This group included intraoperative bleeding within seven of our patients. Such bleeding is usually straightforward to manage and does not cause any significant consequences. As well as this study was got Ventriculostomy stoma closure through new arachnoid granulation structures with the administration of steroids around the inflamed stoma may be useful in causing ETV failure. **Conclusions:** In general, endoscopic third ventriculostomy is a very successful approach to treating hydrocephalus in chosen patients. It is associated with a very low risk of persistent morbidity and avoids the morbidity associated with VP shunts. Ventriculostomy stoma closure through new arachnoid granulation structures with the administration of steroids around the inflamed stoma may be useful in causing ETV failure.

Keywords: Hydrocephalus; ETV; CSF leak; and Infection.

INTRODUCTION

Hydrocephalus is a condition caused by an abnormal increase in the volume in cerebrospinal fluid (CSF) within the brain ventricles, which raises intracranial pressure and causes brain damage [Beems, T. *et al*., 2002]. Hydrocephalus is recorded in 1-3 per each 1,000 live births in Brazil. [César, J. *et al*., 2018- Demerdash, A. *et al*., 2017]

Endoscopic third ventriculostomy (ETV) is being proved to be a safe and efficient therapy for many Etiologies of hydrocephalus. There is evidence that younger age is indicative underlying a worse outcome following ETV in children, and some data on the role in hydrocephalus etiology for outcomes after ETV [Drake, J. *et al*., 2006 - Gorayeb, R.P. *et al*., 2004]. The role of ETV in the treatment of adult hydrocephalus is less well investigated. Findings from childhood research may not be relevant to adults due to differences in the physiology underlying brain development, intracranial compliance, as well as cerebrospinal fluid (CSF) generation, and absorption. [Gorgoglione, N. *et al*., 2021; Grunert, P. *et al*., 2003]

William Mason Mixter proved in 1923 that endoscopic fenestration of the third ventricle floor could successfully cure congenital hydrocephalus, giving the development of endoscopic third ventriculostomy (ETV) for a therapeutic method to hydrocephalus that avoided extracranial shunts. This approach has been improved and regarded as a commonly used tool for the medical management of hydrocephalus over the years. The benefits of ETV for extracranial shunts were widely reported, with superior results in terms of infection risk and failure rate. [Hopf, N.J. *et al*., 1999 - Kulkarni, A.V. *et al*., 2013]

ETV is a type of intracerebral surgery performed using the neuro-endoscopic method that allows the flow of CSF trapped within the ventricles to be diverted to the subarachnoid cisterns. The efficacy of ETV has been well documented throughout the literature, but it is contingent on proper surgical indication. Nonetheless, there are disparities in effectiveness rates, as neurosurgical clinics report varying results, particularly for the pediatric population. One cause of this data gap is a failure to pay attention to technical aspects, considering this treatment is still limited to neurosurgical services. ETV was used as a major method for treating children and adults suffering hydrocephalus at two prominent neurosurgical clinics in Brazil's Northeast Region in 1994 [Kulkarni, A.V. *et al*., 2017- Martins, F.J. *et al*., 2018]. This paper aims to assess the outcomes of Endoscopic Third Ventriculostomy to treatment

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Endoscopic Third Ventriculostomy in Iraq by section study.

PATIENTS AND METHODS

This study was conducted some examinations on the ETV data to determine a cross-sectional study on the treatment of endoscopic third ventriculostomy in Iraq by section study where it focused on endoscopic third ventriculostomy patients with ages older than 18 to 50 years. In the methodology of data designs, our data was distributed with 132 patients, which where it divided into two groups, which are the first group presents 66 cases, and the second group presents 66 cases. Our study was collected data from different hospitals in Iraq between 16th July 2021 to 25th August 2022. This data was designed and analysed by the SPSS program.

This paper was sent out of endoscopic third ventriculostomy patients based on ages 18-50 years, sexes with males and females, BMI within 28.46 and >28.46, in addition to signs of coma, Difficulty walking, Fever, Headache, Incontinence, tiredness, Vision issues, as well as Vomiting, and Prior shunt where have yes and no which these results can be found in Table 1, Table 2, Table 3, Table 4, and Table 5.

To further of outcomes, this study was examined of Intraoperative-complications outcomes which include bradycardia, hemorrhage, and neural structure injury, etiology outcomes that present with tumor, aqueductal stenosis, cysts, males, and females, where determine into Figure 1 and Figure 2.

Furthermore, this paper was also determined problems and surgical outcomes, which are Meningitis, Ventriculostomy stoma closure, Presence of the second membrane, Presence of granulation tissue around the stoma, Transient third nerve palsy, Subdural effusion, Seizure, and Haemorrhage, as well as post-operative complications that include hygroma, hematoma, CSF leak, infection, and seizures where these results can be cleared in Figure 3, and Figure 4. Besides to that, this study was assessed Kaplan-Meier determination of proportion ETV survival in correlation survival of patients with time.

Finally, this paper was assessed of Mortality and morbidity of endoscopic third ventriculostomy patients in comparison with controls that get on with Mortality that include With ETV and Without ETV, while Morbidity includes CSF leak, Age, Sex, Meningitis, Hematoma, and Infection where these results can be found in Table 6.

RESULTS

Table 1: Distribution of endoscopic third ventriculostomy patients based on ages

N	**V**	132
	Mi	0
M		34.0000
SEM		.83193
Me		34.0000
Mo		18.00[a]
SD		9.55818
Var		91.359
Sk		.000
SES		.211
Ra		32.00
Min		18.00
Max		50.00
Su		4488.00

Table 2: Distribution of endoscopic third ventriculostomy patients based on sex

		F	**P (%)**	**VP (%)**	**CP (%)**
V	Female	59	44.7	44.7	44.7
	Male	73	55.3	55.3	100.0
	T	132	100.0	100.0	

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Table 3: Distribution of endoscopic third ventriculostomy patients based on BMI

		F	P (%)	VP (%)	CP (%)
V	<28.46	56	42.4	42.4	42.4
	>28.46	76	57.6	57.6	100.0
	T	132	100.0	100.0	

Table 4: Distribution of endoscopic third ventriculostomy patients based on symptoms

		F	P (%)	VP (%)	CP (%)
V	Coma	16	12.1	12.1	12.1
	Difficulty walking	16	12.1	12.1	24.2
	Fever	19	14.4	14.4	38.6
	Headache	20	15.2	15.2	53.8
	Incontinence	28	21.2	21.2	75.0
	Tiredness	9	6.8	6.8	81.8
	Vision problems	15	11.4	11.4	93.2
	Vomiting	9	6.8	6.8	100.0
	T	132	100.0	100.0	

Table 5: Distribution of endoscopic third ventriculostomy patients based on prior shunt

		F	P (%)	VP (%)	CP (%)
V	No	52	39.4	39.4	39.4
	Yes	80	60.6	60.6	100.0
	T	132	100.0	100.0	

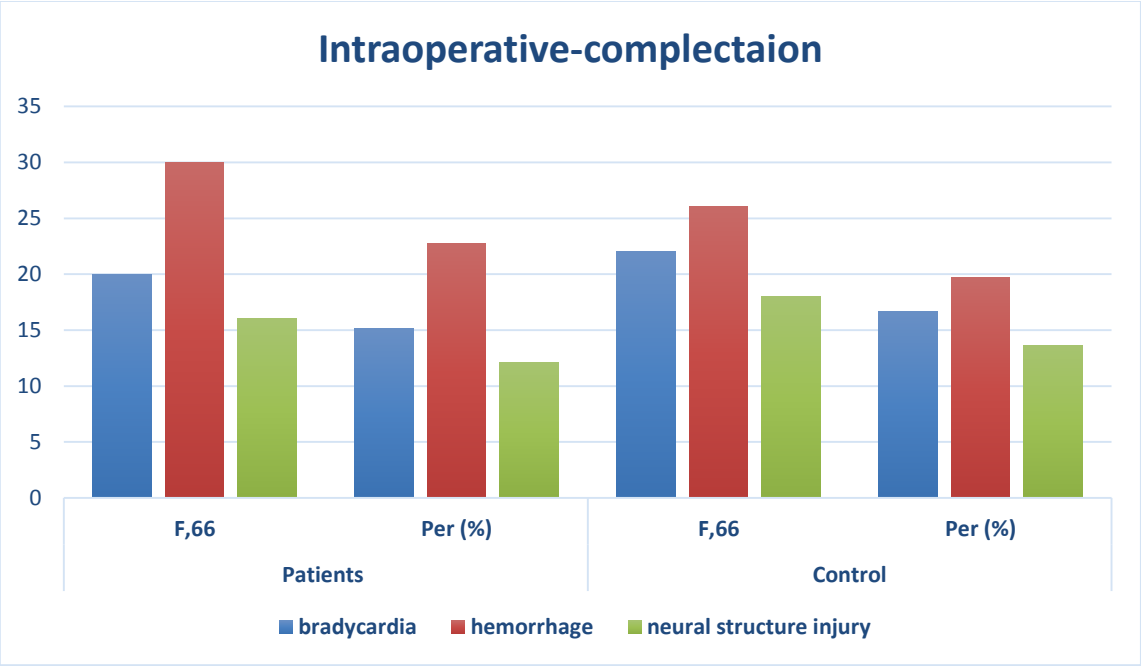

Figure 1: Examine of Intraoperative-complications outcomes

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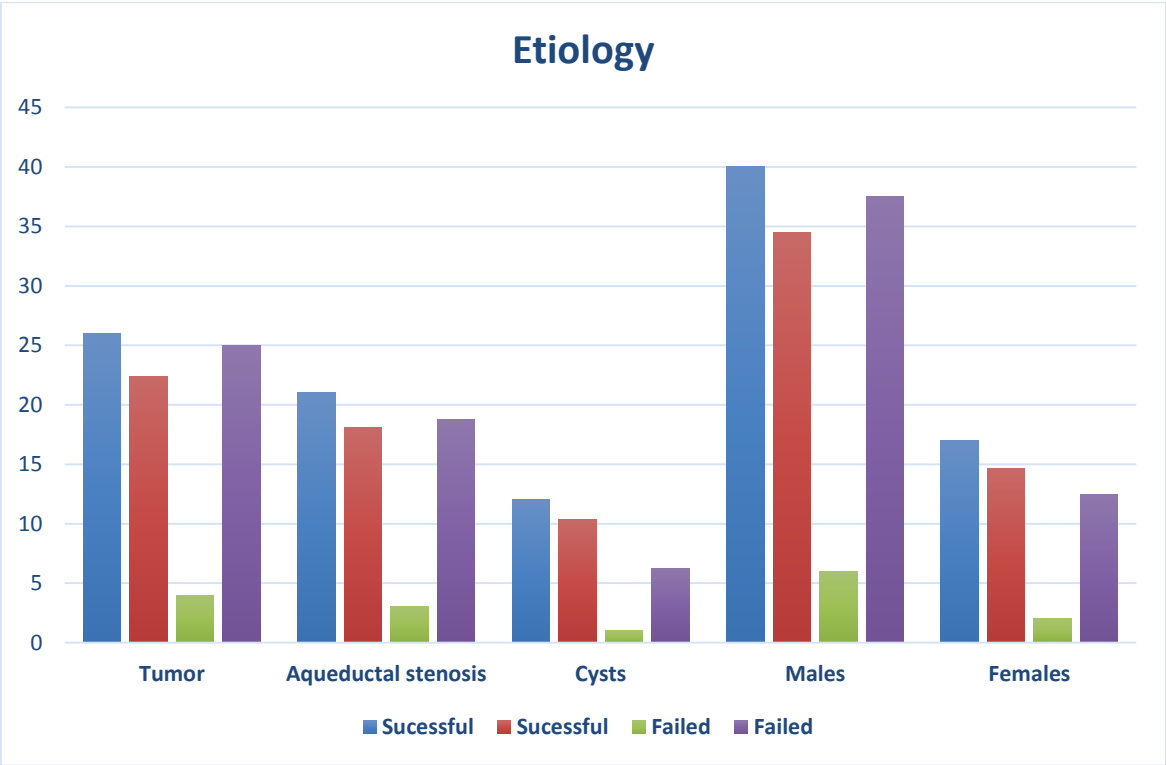

Figure 2: Determinations of Etiology Outcomes

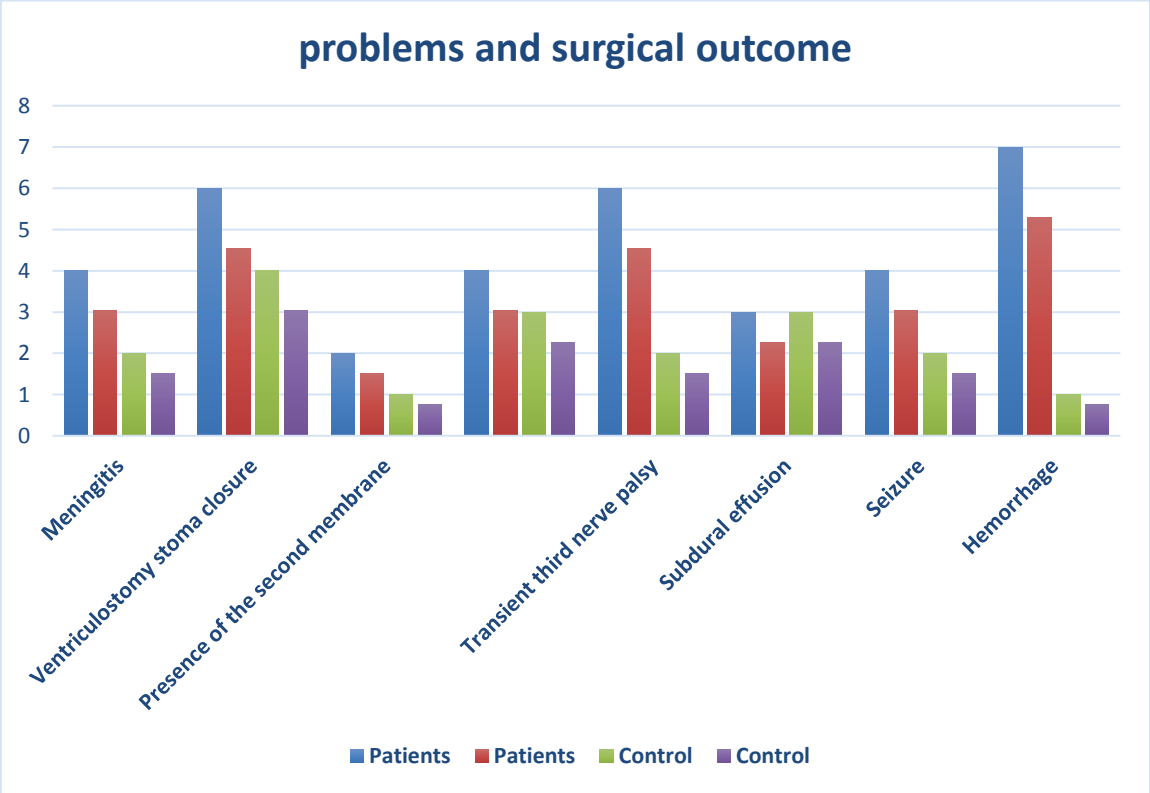

Figure 3: Determinations of problems and surgical outcomes

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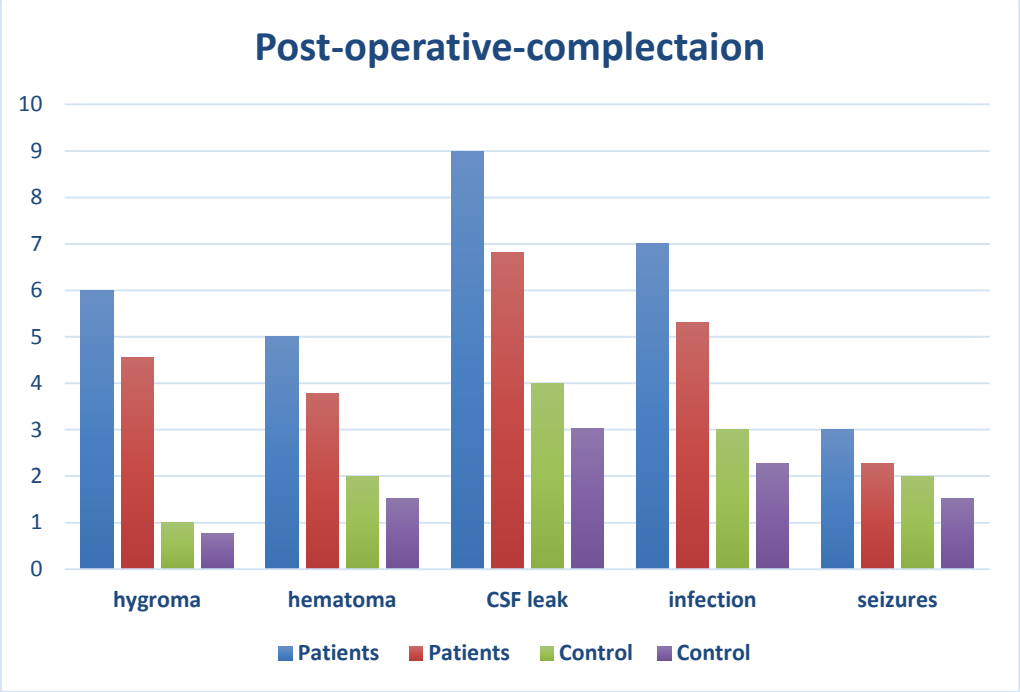

Figure 4: Post-operative complications

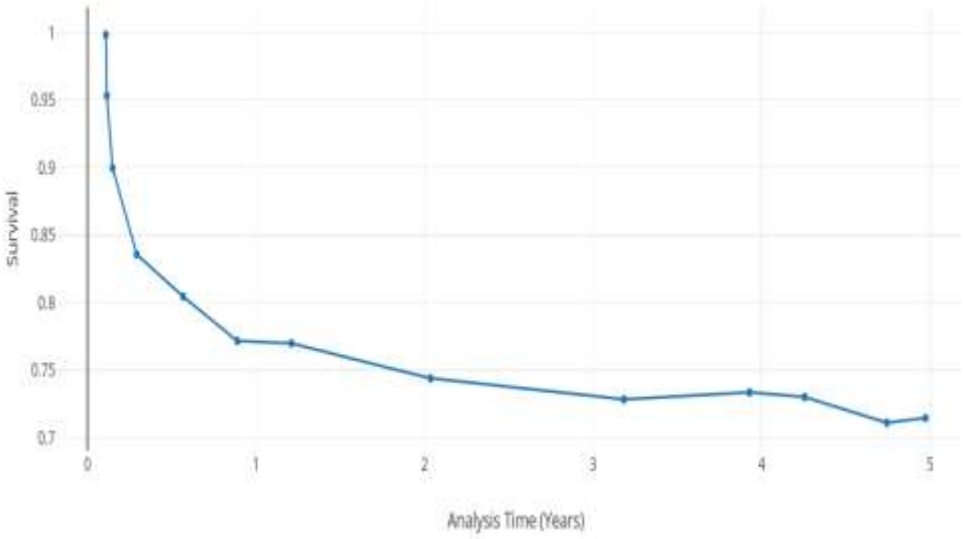

Figure 5: Kaplan-Meier determination of proportion ETV survival

Table 6: Assessment of Mortality and morbidity of endoscopic third ventriculostomy patients in compare with controls

Outcomes factors	Patients	Controls	P-value
Mortality	20 (15.15%)	8(6.06%)	0.0321
With ETV	5 (3.78%)	2 (1.51%)	0.054
Without ETV	15 (11.36%)	6 (4.54%)	0.00544
Morbidity	35 (26.51%)	10 (7.57%)	0.00645
CSF leak	12 (9.09%)	3 (2.27%)	0.00322
Age	4 (3.03%)	2 (1.52%)	0.0452
Sex	2 (1.52%)	1 (0.76%)	0.0477
Meningitis	2 (1.52%)	2 (1.52%)	0.053
Hematoma	7 (5.3%)	1 (0.76%)	0.0011
Infection	8 (6.06%)	2 (1.52%)	0.002771

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DISCUSSION

The treatment for obstructive hydrocephalus is difficult, and numerous studies have been conducted to examine various treatment approaches and their outcomes. ETV is increasingly being preferred over traditional shunting operations to treat obstructive hydrocephalus across selected patients in neurosurgery facilities with neuro endoscopic competence in industrialized nations. This growing popularity is because ETV allows patients to be shunt-free and is beneficial with the management of hydrocephalus, regardless of etiology, patient age, or other contributing variables. However, there have been reports of disparities in success rates.

Hopf [McLaughlin, M.R. *et al*., 1997] examined the outcomes of 100 consecutive treatments in 95 patients and discovered that ETV is most successful in treating simple obstructive hydrocephalus resulting from aqueduct stenosis with space-occupying lesions. It was also deemed beneficial for two-thirds of the patients whose hydrocephalus was caused by infection or intraventricular haemorrhage. Furthermore, Hopf, et al., argued that patients having obstructive hydrocephalus that have already had shunting are suitable candidates for ETV if the shunt fails. These statements are supported by our data, as we could obtain a significant result in patients suffering aqueduct stenosis, benign cysts, and malignancies.

Many of the participants (48%) of our series were above the age of 35, having a typical age of 36.1 years, with 65.8% being male. This demographic trend corresponds with previous research. In their research of 58 patients, Feng, et al., found an average age of 35 years, with most of the participants being male. In their series of 188 patients, Schroeder, as well as colleagues, found a mean age of 39 years, including 48.32% of men. In a study of 20 cases, Brohi [Sacko, O. *et al*., 2010] reported 65% were men. It is worth noting that most research shows that males have a greater incidence of obstructive hydrocephaly. Our patients' hydrocephalus was caused by malignancies in 22.41% of instances as well as aqueductal stenosis with benign cysts in 28.40%. Feng, et al., discovered comparable etiological tendencies in their cases. Bouras [Sainte-Rose, C. *et al*., 1995] conducted a systematic study on 2617 patients. Our paper found that CSF leaks are the most prevalent immediate post-operative complication with ETV and are caused in part by the raised intraventricular pressure, which prevails immediately following surgery. This group included intraoperative bleeding within seven of our patients. Such bleeding is usually straightforward to manage and does not cause any significant consequences. As well as this study was got Ventriculostomy stoma [Sainte-Rose, C. *et al*., 2001] closure through new arachnoid granulation structures with the administration of steroids around the inflamed stoma may be useful in causing ETV failure.

CONCLUSIONS

In general, endoscopic third ventriculostomy is a very successful approach to treating hydrocephalus in chosen patients. It is associated with a very low risk of persistent morbidity and avoids the morbidity associated with VP shunts. Ventriculostomy stoma closure through new arachnoid granulation structures with the administration of steroids around the inflamed stoma may be useful in causing ETV failure.

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