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RESEARCH ARTICLE
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THE RATIONALE OF LUMBOPERITONEAL SHUNT: IN THE MANAGEMENT OF BENIGN INTRACRANIAL HYPERTENSION.

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Introduction

Idiopathic intracranial hypertension (IIH), also known as pseudotumor cerebri (PTC), is characterized by elevated intracranial pressure in patients with normal cerebrospinal fluid (CSF) composition and neuroimaging[1]. IIH predominantly affects women and has a notable association with obesity. The annual incidence rate is 0.9 per 100,000 in the general population, with the highest incidence rate of 7.9 occurring among obese women aged 15 to 44 years [2]. The accepted criteria for diagnosing IIH include raised intracranial pressure without hydrocephalus or mass lesion, normal CSF composition, and no identifiable underlying etiology[3].

Typical symptoms include headache, transient vision obscurations, diplopia, and pulsatile tinnitus. While IIH has often been described as a benign, self-limited disorder, some patients develop optic neuropathy and others experience persistent, disabling symptoms despite treatment[1]. The most significant consequence of IIH is permanent vision loss caused by prolonged papilledema with secondary optic atrophy. Although visual sensory loss is evident in up to 90% of patients, most experience minor visual field defects, such as an enlarged blind spot. Over time, patients may suffer from progressive visual field constriction, color vision disturbances, and eventually central vision loss[4].

A study by Corbett et al. found that approximately half of 57 IIH patients had visual acuity or field loss, with six patients experiencing bilateral blindness[5]. While the severity of visual loss cannot be predicted from the severity of papilledema, it has been noted that once papilledema resolves, the risk of further visual loss diminishes[6]. Therefore, the resolution of papilledema is a critical treatment goal to stabilize or restore vision.

Treatment options for IIH include both medical and surgical approaches. Typically, medical treatment is the first line of defense, with surgery being considered for patients who present with severe acute visual loss or for those who do not respond to medical management, and experience persistent headaches or ongoing visual deficits[7].

Surgical treatment for IIH primarily involves CSF diversion procedures, most commonly lumboperitoneal (LP) shunts and optic nerve sheath fenestration (ONSF). LP shunts effectively reduce intracranial pressure, alleviating both headaches and papilledema. However, LP shunts can fail over time and may require multiple revisions due to issues such as shunt obstruction, low intracranial pressure headaches, lumbar radiculopathy, abdominal pain, and infection[8 1].

This study was conducted to analyze the outcomes of lumboperitoneal shunt in managing benign intracranial hypertension.

Material and method:
From 01 June 2015 to 01 June 2022, 45 patients were diagnosed with idiopathic intracranial hypertension and were treated in the neurosurgery department, at Lady Reading Hospital, Peshawar.

Upon admission, all patients received an extensive clinical assessment, which included detailed medical, neurological, and ophthalmological examinations. All patients underwent contrast-enhanced brain CT scans and MRIs. Lumbar CSF manometry was performed and documented multiple times, and CSF chemistry was analyzed.

Surgical treatment for IIH was indicated for patients who experienced acute and severe visual loss at initial presentation or those with persistent, intractable headaches or visual deficits that did not improve with adequate medical treatment and repeated lumbar CSF drainage. The surgical intervention involved placing a lumboperitoneal shunt.

Clinical follow-up was performed at 1, 3, and 12 months. Headaches were assessed using the visual analog scale, and fundus examinations were conducted to check for the resolution of papilledema.

Results:
The total number of patients included in the study was 45 in which females were 40(88.9%) and males were 5(11.1%) with a female to male ratio of 8: 1. The ages ranged was 25-55 years with a mean age of 31.5 years. Visual acuity was decreased in 30(66.7%) on presentation and 15(33.3%) were already blind having no light perception. On fundus examination, papilloedema was noted in 32(71.1%) and bilateral optic atrophy in 13(28.8%) patients. Slit-like ventricles on MRI were noted in 28(62%) and narrow ventricles in 13(28.8%), while in 4(8.8%) patients, ventricles were normal looking on MRI. On lumber puncture opening CSF pressure was severely high in 33(73.3%) and mild to moderate in 12(26.6%).

The outcome was an improvement in general symptoms, Headache was relieved in almost all patients 37(82.1%) while others reported improvement in severity and frequency. Papilloedma was completely resolved in 23(71.8%) and downgraded in 9(28.1%) patients with improvement in visual acuity. However, no improvement in vision was seen in those patients who were blind at presentation due to optic atrophy.

The most common complication encountered was blocked LP shunt 13(28.8%) which required shunt revision, followed by infection 7(15.5%). The most common cause of obstruction was the migration of the distal catheter.

Discussion:
Idiopathic intracranial hypertension (IIH) likely represents a diverse clinical syndrome, with its pathogenesis potentially differing among patients[1 9]. Various pathophysiological mechanisms have been proposed based on neuroimaging and cerebrospinal fluid (CSF) hydrodynamic studies. These include increased brain volume due to higher water content, elevated blood volume, raised venous pressure, an increased rate of CSF production, and a reduced rate of CSF absorption[10 11]. The treatment for IIH encompasses a range of approaches, including the use of acetazolamide, corticosteroids, furosemide, repeated lumbar punctures, and surgical interventions.

Conclusion:
Idiopathic intracranial hypertension (IIH) represents a complex syndrome with diverse manifestations rather than a single disease. It can present in acute, subacute, or chronic forms, and the severity can

be classified as mild, moderate, severe, or fulminant based on the opening lumbar cerebrospinal fluid (CSF) pressure. Surgery is often considered for patients who do not respond to medical treatments or cannot tolerate medications. According to our study, predictors for deciding on surgical intervention may include severe and fulminant opening CSF pressures and inadequate response to repeated lumbar punctures. The lumboperitoneal shunt is an effective and straightforward option for managing severe headaches and visual disturbances linked to IIH. Its effectiveness can be maximized through careful patient selection and precise shunt placement, following strict protocols for the procedure.

Objective:
To analyze the outcome of lumboperitoneal shunt in managing benign intracranial

Consent was taken from the hospital's ethical committee and patients were taken.
Including criteria: All patients with benign intracranial hypertension were included. Excluding criteria: patients having brain tumors, hydrocephalus, meningitis, encephalitis, and visual impairments due to other ophthalmological diseases.

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