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ORIGINAL ARTICLE

Epidermoids in the Cerebellopontine Angle Region

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ABSTRACT

Aim and objectives: To understand the development and outcomes of the treatment of cerebellopontine angle epidermoid.

Materials and methods: The prospective study was conducted at the neurosurgery department of Lady Reading Hospital Peshawar from January 2023 to June 2023 after approval from the institutional review board. A total of 86 participants were included in the study through a convenient sampling technique. The age of the participants was from 15-65 years, irrespective of their gender. Individual informed consent was obtained from the participants. All the data was collected from patient's examinations and lab investigations. The collected data was analyzed by using the latest version of SPSS 24.

Results: A total of 86 participants were selected for the current study and their age was from 15-65 years. (25) 29. 06 % and (22) 25.58 % of them were from 26-35 and 56-65 years of age respectively. The mean age of the participants was 39 ± 6.24 years. There were 48.83 % (42) males and 44 (51.16 %) female participants. The mean duration of symptoms was 6.8 ± 2.64 months. . Headache was the most common symptom 72.09 % followed by hearing impairments 25.58 %. 22.09 % of them had 22.09 % vertigo and 20.93 % had tinnitus, furthermore, 31.59 % had an imbalance. 30.23 % and 9.30 % had positive cerebellar signs and pyramidal signs respectively. 73.13 % and 11.94 % retro sigmoidal and retro sigmoidal plus sub-temporal surgical approaches. 29 (43.28 %) had a gross total, and 23 (34.32 %) had a near-total resection of epidermoid.

Conclusion: The current study concluded that accurate diagnosis can be made through a proper assessment and investigation of the patients. Furthermore, surgical interventions were safe and effective procedures for patients having CP angle epidermoids depending upon the techniques and post-op care of the patients to minimize the complications after the surgery.

Keywords: Cerebellopontine angle, Epidermoid, Trigeminal neuralgia, Cerebellar signs.

INTRODUCTION

Slow-growing, not dangerous, and extremely uncommon, cranial epidermoids are thought to originate from residual ectodermal resting. About 1% of the total intracranial tumors constitute epidermoid tumors, and they are perhaps the most prevalent kind of brain tumor in embryos. This cerebellopontine angle (CPA) is a frequent site for epidermoid tumors[1,2]. Nevertheless, just 7 percent of tumors in this region are of this type[2]. When epidermoids irritate the cranial nerve (CN), it causes the CN to become hyperactive and dysfunctional. The irritation of the CNs can bring on symptoms of trigeminal as well as additional neuralgias. The subarachnoid region is the home of epidermoid tumors. At first, and until the subarachnoid receptacle near the spinal cord and brain are full. The bulk effect is seen when all cavities (cisterns, crevices, as well as ventricles) have been filled[3]. MRI has become the diagnostic procedure of preference. Diffusion-weighted imaging sequences used with MRI are diagnostic[4]. Clients having cranial epidermoids often appear to have multiple neurological manifestations, with headaches being the most prevalent. Facial nerve damage is more common in patients with CPA epidermoid tumors than those with vestibular schwannomas or meningiomas, demonstrating this tendency[5]. Although the exact source of the ache in this condition (trigeminal neuralgia) has not been determined, it is believed to be caused by compression of the nerve stem of the trigeminal nerve at its pontine entrance region. The trigeminal neuron demyelinates when it is compressed by a tumor, which exerts localized pressure over the nerve. The amount of times trigeminal neuralgia refers to tumors at the CP angle among series ranging from 1% to 9.9%[6]. A squamous epithelium that has been stratified lines epidermoid cysts, whereas this epithelium is overlaid by a connecting-tissue lamina whose structure is morphologically unrecognizable compared to the pia mater. Symptoms from these tumors might linger for a long time because of how slowly they develop[7]. Epidermoid tumors within the dura mater (grade I) are not cancerous and are made up of desquamated epithelial cells keratin and bordered by a very thin covering of squamous epithelium. It is hypothesized that these abnormalities arise from misaligned ectodermal cells left over preceding the final closure inside the neural tube[8]. Most significantly, unlike most other types of tumors, epidermoid cysts tend to grow slowly and steadily in a logarithmic instead of a parabolic arrangement, mirroring the shedding of the typical human epidermis; this may result in enormous masses or widespread multicompartment illness at the point of evaluation. It's exceedingly unusual, yet malignant change can happen[9]. Therefore, As the exact position of a tumor has a significant impact on the severity of the symptoms experienced by the individual and complications, suggestions for treatment might vary widely. Neurotologists and neurosurgeons work together to treat epidermoid malignancies of the central auditory pathway (CPA). In order to better understand the natural development and efficacy of surgical and medical therapy for such infrequent growths, the present research reviews patients having cerebellopontine angle epidermoid.

Aim and objectives: To understand the development and outcomes of the treatment of cerebellopontine angle epidermoid.

MATERIALS AND METHODS

The prospective study was conducted at the neurosurgery department of Lady Reading Hospital Peshawar from January 2023 to June 2023 after approval from the institutional review board. A total of 86 participants were included in the study through a convenient sampling technique. The age of the participants was from 15-65 years, irrespective of their gender. Those having cerebellopontine angle epidermoid confirmed after the Diffusion-weighted imaging sequences MRI and other neurological had been included in the study, while those having chronic diseases like cardiac, liver, and autoimmune diseases were excluded from the study. Individual informed consent was obtained from the participants. All the data was collected from patient's examinations and lab investigations. The collected data was analyzed by using the latest version of SPSS 24.

RESULTS

A total of 86 participants were selected for the current study and their age was from 15-65 years. (25) 29. 06 % and (22) 25.58 % of them were from 26-35 and 56-65 years of age respectively. The mean age of the participants was 39 ± 6.24 years. There were

48.83 % (42) males and 44 (51.16 %) female participants. The mean duration of symptoms was 6.8 ± 2.64 months. Table 2 represents the signs and symptoms of the individuals. Headache was the most common symptom 72.09 % followed by hearing impairments 25.58 %. 22.09 % of them had 22.09 % vertigo and 20.93 % had tinnitus, furthermore, 31.59 % had an imbalance. 30.23 % and 9.30 % had positive cerebellar signs and pyramidal signs respectively. Cranial V (15.11 %), Cranial nerve VII (9. 30 %), and Cranial nerve VIII (10. 46 %), moreover, 8.13 % had raised signs of ICT. Table 3 highlights the outcomes of treatment. 67 (77.90 %) of the patients underwent surgical interventions. 73.13 % and 11.94 % retro sigmoidal and retro sigmoidal plus sub-temporal surgical approaches. 29 (43.28 %) had a gross total, and 23 (34.32 %) had a near-total resection of epidermoid. 4.92 % had a post-op infection 5.97 % had CSF leakage, 7.46 % had hearing loss and 2.98 % had meningitis.

Table 1: Demographic Characteristics

Age (years)	Number	Percentage
15-25	8	9.30 %
26-35	13	15.11 %
36-45	25	29.06 %
46-55	18	20.93 %
56-65	22	25.58 %
Gender		
Male	42	48.83 %
Female	44	51.16 %
Duration of symptoms (months)		6.8 ± 2.64

Table 2: Signs and Symptoms

	Number	Percentage
Vertigo	19	22.09 %
Headache	62	72.09 %
Trigeminal neuralgia	12	13.95 %
Seizure	6	6.97 %
Hearing problem	22	25.58 %
Diplopia	9	10.46 %
Tinnitus	18	20.93 %
Facial muscles palsy	13	15.11 %
Imbalance	27	31.39 %
Pyramidal signs	8	9.30 %
Cerebellar signs	26	30.23 %
Nerves involved		
Cranial nerve V	13	15.11 %
Cranial nerve VII	8	9.30 %
Cranial nerve VIII	9	10.46 %
Cranial nerve IV	3	3.48 %
Cranial nerve VI	1	1.16 %
Raised ICT sign	7	8.13 %

Table 3: Outcomes of Treatment

	Number	Percentage
Surgical intervention	67	77.90 %
Surgical approach		
Retro sigmoidal	49	73.13 %
Retro sigmoidal + sub temporal	8	11.94 %
Middle fossa	3	4.47 %
Far lateral	7	10.44 %
Extent of removal		
Gross total	29	43.28 %
Near total	23	34.32 %
Subtotal	15	22.38 %
Post-complications		
Infection	10	14.92 %
CSF leakage	4	5.97 %
Hearing loss	5	7.46 %
Meningitis	2	2.98 %
Facial paresis (mild)	3	4.47 %

DISCUSSION

Slow-growing benign tumors called epidermoid cysts often encase neurovascular structures without dislodging them. Trigeminal neuralgia as well as facial paralysis are common symptoms when the 5th and 7th facial nerves become compressed[10]. Surgery treating CPA epidermoid cysts can be successful, but only when the capsule that holds the tumor has been eliminated in its whole. This becomes a major issue for two reasons: first, the speed at which tumors are removed after revision surgery is typically significantly lower than it was during the first operation, and second, radiation therapy is inefficient in treating recurrent cancers[11]. In the current study, the mean duration of symptoms was 6.8 ± 2.64 months. Headache was the most common symptom 72.09 % followed by hearing impairments 25.58 %. 22.09 % of them had 22.09 % vertigo and 20.93 % had tinnitus, furthermore, 31.59 % had an imbalance. 30.23 % and 9.30 % had positive cerebellar signs and pyramidal signs respectively. Cranial V (15.11 %), Cranial nerve VII (9. 30 %), and Cranial nerve VIII (10. 46 %), moreover, 8.13 % had raised signs of ICT. A similar study conducted by Yawn RJ et al reported that headaches (57%) were the leading presenting complaint. Among these 28% had prior asymmetrical sensory loss of hearing, 6% had prior nerve damage to the facial paralysis, and 6% had prior hemifacial spasm. Of the remaining 83% who underwent, 46% had a GTR, 13% had a near entire removal, and 41% had an extensive STR. The first 28% were monitored for a mean duration of 56 months[12]. Afridi EA et al concluded that participants had a 10.4% incidence of CP tumors, with the epidermis becoming the most frequent lesion 7.4% of individuals, and 75% of all CP angle tumors[13]. Another comparable study by Czernicki T et al finds that 35.3 % had vertigo, 11.8 % had trigeminal neuralgia and seizure, and 5.8 % had headaches and diplopia each[14]. Symptoms persisted for an average of 11.2 months. Impairment of deafness being the most prevalent primary symptom (67.7%), subsequent paralysis of face and eyelid muscles (60%), trigeminal neuralgia (TN) (46.7%), as well as dizziness (46.7%). CN VIII had been the most prevalent type (66.7%), subsequent to CN VII (60%), along with CN V (46.7%). Critical care nerves IX and X, as well as CNs IV and VI, were also involved. The cerebellum was involved in 80% of cases. Three-quarters of the sample showed signs of elevated ICT[15]. The average rate of tumor material elimination was 97.4%, while the rate of capsule removal was 78.3%. The percentage of those who kept their functional hearing and facial nerves was 90.7% as well as 94.4%, respectively[16].

CONCLUSION

The current study concluded that accurate diagnosis can be made through a proper assessment and investigation of the patients. Furthermore, surgical interventions were safe and effective procedures for patients having CP angle epidermoids depending upon the techniques and post-op care of the patients to minimize the complications after the surgery.

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