ORIGINAL ARTICLE

Incidence of Cerebrospinal Fluid Leak in Patients with Myelomeningocele and TCS Repair

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ABSTRACT

Objective: The aim of this study is to determine the frequency of cerebrospinal fluid leak in patients undergoing myelomeningocele and TCS repair.

Study Design: Cross-sectional

Place and Duration: This study was conducted at Neurosurgery Unit, Mardan Medical Complex, Mardan for duration of three years from January, 2017 to December, 2019.

Methods: Total 76 patients of both genders were enrolled in this study. Patients were ages between 4-22 years. Patients detailed demographics age, sex and BMI were recorded after taking written consent. Patients who underwent myelomeningocele and TCS repair were included. Frequency of cerebrospinal fluid leak in patients was calculated. Complete data was analyzed by SPSS 24.0 version.

Results: Mean age of the patients was 7.9 ± 3.5 years. Total 41 (53.95%) patients were males and 35 (46.05%) were females. Out of 76 patients 26 (34.21%) had CSF leak. Mean duration of CSF leaks was 4-20days. Among 26 patients, 17 patients had MMC repair, 4 patients had TCS release and 5 patients had meningocele repair. Five patients had a CSF leak with HCP postoperative signals that settled by inserting the shunt in a single position along with a primary wound repair, strengthened by tincture benzoyl. After stitches improved by benzoyl tinctures, three other patients showed signs of HCP without CSF leak and were later put in the shunt.

Conclusion: In this study, we concluded that in patients undergoing myelomeningocele and TCS repair, the incidence of CSF Leaks is greater. The tincture benzoyl will heal these patients after skin strengthening.

Keywords: Myelomeningocele (MMC), Cerebrospinal fluid leak (CSF), Tether cord syndrome (TCS),cerebrospinal fluid leak (CSF)

INTRODUCTION

The aim of this study was to understand the occurrence and the function of CSF leak and the tincture benzoyl in CSF leak management following the repair of congenital spinal deformities, such as myelomeningocele and meningocele.

Spinal dysraphism includes a number of congenital defects, resulting in a defect neural arc that herniates meninges or neural elements and leads to a variety of clinical conditions (with no external lesion). [1] This can lead to multiple disorders such as meningocele, myelomeningocele, lipomeningomyelocele, and myeloschisis. Due to the poor nutrition and maternal health it has an estimated prevalence of about two to 4/1000 people, the prevalence of these conditions is great in developing countries. [2]

This anomaly involves multiple related abnormalities, including bladder dysfunction, foot abnormalities, heart attacks, and hydrocephalous abnormalities in the central nervous system. [3] Remedial treatment of these defects is necessary and complications such as meningitis or progressive weakness can also be avoided. [4] The surgery is not complicated and CSF leaks are a leading complication for this operation, as are wound dehiscence and infection. It may also add to the patient's morbidity. In addition these patients are very susceptible due to the associated hydrocephalus to such surgeries as the VP shunt. [5]

Postnatal repair is the standard treatment of MMC. [6] Post-operative complications including leaks, inflammation, ventriculoperitoneal (VP) hydrocephalus and injury-related dehiscence are equalized in surgery. [7,8,9] In over 85–90 percent of patients with MMC, hydrocephalus (HDC) occurs. [5]MMC patients need shunts to avoid the neurological and intellectual compromises associated with substantial ventriculomegals at least 54 to 80 percent.[6] CSF leakage is one of the deadly complications after an MMC operation, which increases patient morbidity and death. [6,8] The rate of CSF leaks after operation varies between 18% [10] and 30%. [7] This study will help us produce local post-MMC repair statistics. These findings will be released by other neurochirurgs to remind them of the local magnitude, and we will be able to further rectify our management plan for the future on the basis of the results of this report.

MATERIAL AND METHODS

This cross-sectional study was conducted atNeurosurgery Unit, Mardan Medical Complex, Mardan for duration of three years from January, 2017 to December, 2019and comprised of 76 patients. Patients details demographics including age,sex and BMI were recorded after taking written consent. Patients with history of myelomeningocele and TCS repair those with no consent were excluded from this study.

Patients were ages between 4-22 years. Patients who underwent myelomeningocele and TCS repair were enrolled. Frequency of cerebrospinal fluid leak in patients was calculated.Information such as sex and type of procedure on a proforma was noted days after first surgery,

associated infections, hydrocephalus and management type. Management type was conservative in applying tincture benzoyl paste, refreshing the edges of the wound and rework in the form of a ventriculoperitoneal shunt (VP) or the repair of the dural leaking site. Complete data was analyzed by SPSS 24.0 version. Mean±SD was applied. Frequencies and percentages were recorded in tabulation form.

RESULTS

Mean age of the patients was 7.9 ± 3.5 years. Total 41 (53.95%) patients were males and 35 (46.05%) were females. Out of 76 patients 26 (34.21%) had CSF leak. Mean duration of CSF leaks was 4-20days.(table 1)

Table 1: Baseline detailed demographics of enrolled patients

Variables	Frequency	% age
Sex		
Males	41	53.95
Females	35	46.05
Mean age (years)	7.9 ± 3.5	
CSF Duration (days)	4-20	

Among 76 patients 26 (34.21%) had CSF leak in which mostly 19 (73.08%) were males and 7 (26.92%) patients were females. (table 2)

Table 2: Frequency of CSF leaks among patients

Variables	Frequency	% age
CSF Leaks		
Yes	22	32.35
No	46	67.65
Gender		
Male	19	73.08
Female	7	26.92

Out of 26 patients, 17 patients showed MMC repair, 4 patients had TCS release and 5 patients had meningocele repair. Five patients had a CSF leak with HCP postoperative signals that settled by inserting the shunt in a single position along with a primary wound repair, strengthened by tincture benzoyl. (table 3)

Table 3: Distribution of CSF leaks postoperatively according to repairs

Variables	Frequency (n=26)	% age
Myelomeningocele (MMC)	17	65.4
TCS release	4	15.9
Meningocele repair	5	19.23

DISCUSSION

The main postoperative complications for spinal dysraphy are postoperative infection and CSF leaks and the frequency of CSF leaks in various studies ranged from eight percent to 30 percent. [11,12] In our study, we recorded 32,5% post-op CSF leak rate; many of these patients responded to plain sutures of skin strengthening along with a tincture application of post-op benzoyl, and another study by Marino R also supported and accepted the use of CSF leak tincture benzoyl. [13] The latest version is available. Benzoyl tincture is a natural agent used for fissures, leaks, and dissolving, but it is also known as triggering allergic reactions and contact Dermatitis in a wound site, Scardamaglia and others have stated that benzoyl may not itself be responsible for any allergic reaction.[14]

In our research, expansileduraplasty due to recurring infection and leak was essential for four only patients. Another complication of spinal dysraphism is tying the rope, where patients with neurological manifestations which develop adhesion at the repair site and later, although such problems were possibly not noted due to the limited follow-up period.In our study mean age of the patients was 7.9 ± 3.5years and majority of the patients were males 53.95%. Mean duration of CSF leaks was 4-20 days.[15]

In our study out of 76 patients, 26 (34.21%) had CSF leak in which mostly 19 (73.08%) were males and 7 (26.92%) patients were females.Out of 26 patients, 17 patients showed MMC repair, 4 patients had TCS release and 5 patients had meningocele repair. Five patients had a CSF leak with HCP postoperative signals that settled by inserting the shunt in a single position along with a primary wound repair, strengthened by tincture benzoyl. These findings were comparableto the many previous studies. [15-18]

The increase in symptoms and springs of childhood are usually linked to the lengthening of the spinal canal which causes gradual injuries of the spinal cord linked to metabolic, vascular and mechanical variables in past experimental studies. There are reports that show that two occurrence levels are the most frequent time at which the symptoms are seen: one in two or four years, and one in eight or ten; but only one in five or nine years. Our procedure, in which all the patients with hydrocephalus had a shunt VP before or at the same time, indicates a very low incidence of myelomeningocene repair. Other factors such as skin flaps were also considered to prevent C.S.F leaks. In 365 cases (88 %of the total) hydrocephalus was detected in another sequence and all were removed. Ventriculitis has occurred in 17 cases in those patients following shunt insertion (4%). The shunting related infections included age during shunt placement, local scalp status, shunt procedure time, use of prophylactic antibiotics and general health of the patient. Different factors found were responsible. [19]We concluded in this study that Frequency of CSF leaks was greater in patients undergoing myelomeningocele and TCS repair. These patients can be cured after skin reinforcement by using tincture benzoyl.

CONCLUSION

In this study, we concluded that in patients undergoing myelomeningocele and TCS repair, the incidence of CSF Leaks is greater. The tincture benzoyl will heal these patients after skin strengthening.

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