Subdural Hematoma and Effusion in Children

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ABSTRACT:

BACKGROUND:

Blood gathers between the inner layer of the dura mater and the arachnoid mater. Usually resulting from tears in bridging veins which cross the subdural space, subdural hemorrhages may cause an increase in intracranial pressure (ICP), which can cause compression of and damage to delicate brain tissue. A subdural effusion is a collection of cerebrospinal fluid

OBJECTIVE:

To gate an opinion about the types of surgical procedures which had been done for the collected cases into 2 centers in Baghdad

METHODS:

This is a prospective study conducted at 2 Neurosurgical Hospitals in Baghdad, between September 2012 to December 2013, on 21 children and infants of subdural collection of fluid excluding abscess ages ranging from 40 days to 13 years . Clinical data was collected including symptoms and signs, in addition to assessment of radiological picture and subdural tab and diagnostic burr hole proved the diagnosis .treatment ranged from conservative to surgical interference included burr hole ,subdural peritoneal shunt and craniotomy. condition of the patients during discharge from the hospital was evaluated

RESULTS:

In this study , the higher percentage of patient were under the age of one year. no great difference in the sex of patients , disturbance of consciousness was the more type of presentation , unilateral subdural collections were more than bilateral collections. only 12 patients had surgical interference , of these 12 the majority had subdural peritoneal shunt , which seemed to be the most convenient procedure in chronic cases but in acute cases burr holes were the most convenient procedure. craniotomy was also used in treating chronic cases.

CONCLUSION :

Most of the patient were under one year old , brain ct scan was the diagnostic procedure , brain ultrasound was also useful in diagnosis of subdural collection. the most convenient surgical treatment in acute cases was the burr holes and in chronic cases was the subdural -peritoneal shunt , and to arrange for surgical interference when decided as early as possible to gate better outcome

KEYWORDS: chronic subdural hematoma, traumatic brain injury, burr hole aspiration, increase intracranial pressure, ultrasound.

INTRODUCTION:

Subdural space is a potential space between the dura matter and the arachnoid matter. It contains a thin film of serous fluid. [1]

The thin walled veins of the central nervous system cross the subdural space and are likely to be torn by a sudden movement of the brain leading to slow venous leakage of blood into the subdural space. [2]

Chronic subdural hematomas are of two varieties, occurring most commonly at two extremities of life, infancy and old age. The type seen in below 1 year of age is the result of intracranial hemorrhage that usually has occurred at the time of birth, enlargement of the head may be the first noticeable sign. The initial lesion might be due to a rupture of small bridging veins in the subdural space. [3]

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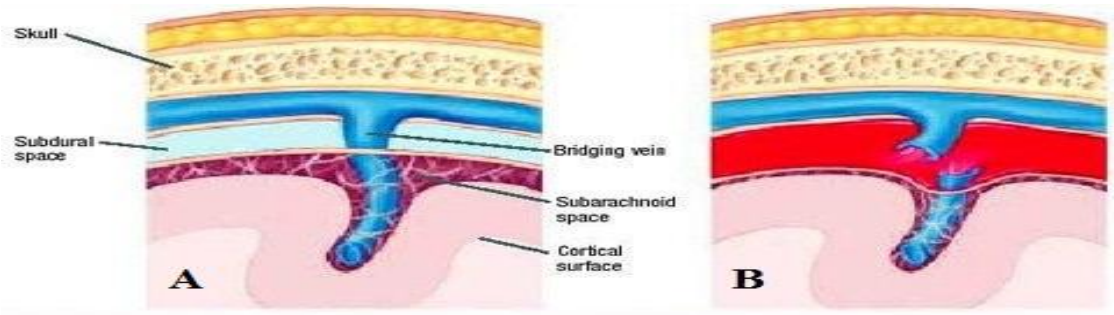


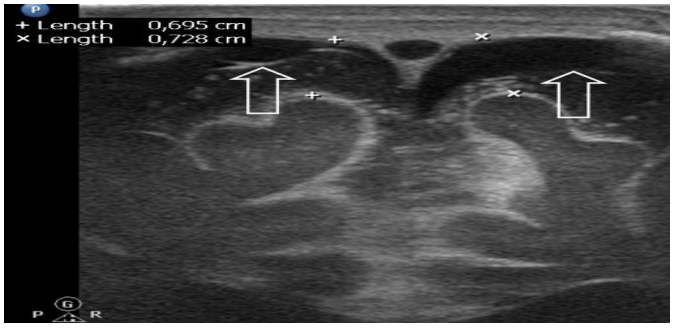
Rupture of the bridging vein and accumulation of blood within the subdural space causing subdural hematoma (Adapted from www.medscape.com, 2014)

Stages of Subdural Hematoma:
There are four recognized anatomic stages which could supply the basis for an estimate of the time from the onset of the hemorrhage:

1. first 18 hours, the subdural blood remains fluid
2. 2nd and 3rddays, the clots are firmer and adherent to the dura.
3. From the 4thday through the 2ndweek, the blood is very dark, clotted and sometimes separates to form yellow fluid.
4. The formation of the neomembrane which was observed in the patients after 39 days from the injury. (4)

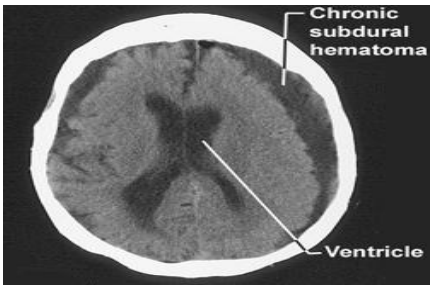
Symptoms and Signs:
The symptoms are those of rising intracranial pressure; drowsiness, vomiting, difficulty with feeding & weight loss. Convulsions, malnutrition, pyrexia, hemiparesis, papilloedema & retinal hemorrhages are occasional features. The clinical picture mimics that of hydrocephalus. (5)

Diagnosis:
Ultrasonography certainly is able to provide valuable information regarding the presence, distribution, & magnitude of subdural fluid accumulation. (6)



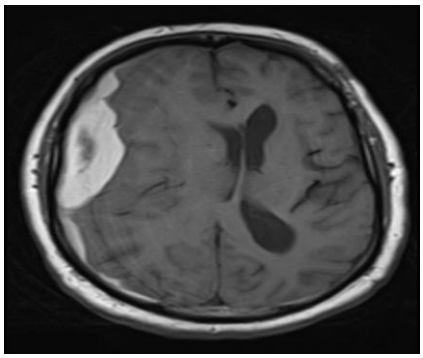
Ultrasound of infant with chronic subdural hematoma.
(Adapted from www.openi.nlm.nih.gov, 2014).

Computed Tomographic Scan (CT SCAN):
The typical subdural hematoma usually remains crescent as the hematoma ages.



Brain CT scan shows left-sided chronic subdural hematoma
, 2014) www.yoursurgery.com (Adapted from

Magnetic Resonance Imaging (MRI):
Thus chronic subdural hematomas are less intense than sub acute subdural hematoma particularly on T1 weighted image



Brain MRI of right-sided chronic subdural hematoma
(Adapted from www.studyblue.com, 2014)

Treatment:
Evacuation of a chronic subdural hematoma has been achieved with the use of craniotomy, burr hole, or with twist drill aspiration. [7,12,13]
A single burr hole is usually sufficient, although two burr holes are sometimes more helpful. [5,13]
Complications:
True reaccumulation of the hematoma, the CT scan will show a hematoma that is hyper dense or of mixed density. [8,11]
Infectious complications include subdural empyema, brain abscess, and meningitis. These are uncommon and occur in less than 1 % of patients. [9,11]
Seizures are reported in about 10% of patients, and all patients with chronic subdural hematoma should be treated with prophylactic anticonvulsant medications. [2,12,13]

PATIENTS AND METHODS:

A prospective study of 21 children and infants of ages ranging from 40 days to 13 years from September 2012 till December 2013 through 15 months including all cases of subdural collection of fluid excluding abscess who where been admitted to 2 neurosurgical centers in Baghdad .
During this study consideration was done for the presentation of cases with their past medical or surgical history , the investigation which were done for them , including 3 types on which diagnosis was made and these were brain CT scan ,brain ultrasound or subdural tap .16 patients had brain CT scan three of them had U/S of the brain , one patient had subdural tap ,and the remaining 4 patients , diagnostic burr holes proved the diagnosis . also the study included the treatment which was offered to them , which ranged from conservative to surgical interference the later included burr hole , subdural -peritoneal shunt and craniotomy .
finally the condition of patient during discharge from the hospital was evaluated hopping to select a standard method of choice

RESULTS:

Gender distributions of 21.

Gender	No. of patients	Incidence
Male	11	52.38%
Female	10	47.62%
Total	21	100%

Males were more than females and represent 82.5% while female represent only17.5%.

Age distribution of 21 patients.

Age (years)	No. of patients	Incidence
≤1	9	42.36%
1 – 5	7	33.33%
6 – 10	3	14.29%
11 – 13	2	9.52%
Total	21	100%

Infants with highest incidence in this age group

Etiology of SDH and effusion.

Etiology	No. of patients	Incidence
Trauma(apart from birth trauma)	12	57.142%
Birth trauma	2	9.52%
Post meningitis	2	9.52%
Post shunting	1	4.762%
Bleeding tendency	1	4.762%
Unknown	3	14.29%
Total	21	100%

Trauma is the major causative factor followed by meningitis

Type of operation.

Type of operation	No. of patients managed by that type of operation	Incidence
Subdural peritoneal shunt	5	41.67%
Burr hole	4	33.33%
Craniotomy or burr hole with shunt	2	16.67
Craniotomy	1	8.33%
Total	12	100%

Surgery were done for 12 patients and the others kept on conservative treatment. Subdural peritoneal shunt and burr hole represents 75% in surgical treatment.

DISCUSSION:

According to our study ,42.86%of cases were of age less than 1 year duration . Rabe[10] found that the mean age group in his study of 62 pediatric patient was 7.1 which indicate the less incidence of subdural collection with progression of the age which may relates the factor of normal growth of the child especially his skull in protection against the development of subdural collection especially in traumatic cases.

In this study trauma comprises 57.142% and 9.52%of the patients were with the history of meningitis this is comparative with the study done by Rabe et al. They found that 25.81% of their patients where with traumatic causes and 38.71% of them were with history of infection. [10]

Fits occur in (19.05%) of the studied patients and this may be occurred as a result of original trauma and made more severe by the additional effect of the hematoma on the cortex underlying it, this may explain the partial improvement of the patient regarding seizure after evacuation of hematoma , according to Matson[5] 50% of patients presented with fit and to Till[9] 40% of patients with history of fit.

Subdural - peritoneal shunt comprised 41.67% from the total surgical procedure. In this study 42.86% of patients completely recovered while only 28.57% died , 28.57% lived with sequel . The last group no surgical interference was done for them either due to refusal of surgery or surgery was not advised. in the operated cases (57.14%) four died (33.33%) and 8 become well 66.67%. according to Rabe ,42 patients of 62 undergone surgical interference and 20 patients had frequent tapping .of the operation group 21 patients (50%) prognosis was good , 36% poor prognosis and 14% died. [10]

CONCLUSION:

- ❖Major etiology is head trauma.
- ❖brain CT scan was the diagnostic procedure
- ❖shunting procedures were found to be sufficient in the majority of the patients.

Recommendations

1-Increase awareness of physicians (in general) and emergency department residents (in particular) about the major aspects of etiology and presentation of patients with chronic subdural hematoma and effusion.

2-Burr hole aspiration surgery is recommended to be the main surgical approach in the management of chronic subdural hematoma.

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