The rate of re-operation in patients with chronic subdural hematoma

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الخلاصه:
النزف المزمن تحت غشاء الدماغ (الام القاسيه) داخل الجمجمة وعلاجه جراحيا بواسطة عملية تثقيب الجمجمه وبزل النزف مع وضع انبوب تصريف في المجموعه الاولى وعدم وضع انبوب تصريف في المجموعه الثانيه.
ما بين كانون الثاني من عام 2010- واب من عام 2014 تم اختيار (40) مريض يعانون من نزف مزمن تحت الام القاسية تتراوح اعمارهم بين (20_58) منهم 26 دكور و 14 اناث تم اجراء عملية تثقيب الجمجمة لهم وبزل النزف في مستشفى الديوانية التعليمي وكانت النتائج كما يلي :
25 مريض , 15 (60%)دكور و10(40%) تم بزل النزيف بعد تثقيب الجمجمة وغسل التجويف المتبقي بالسائل الملحي الفسلجي بدون وضع انبوب تصريف بعد العملية وكان خمسة مرضى (20%) من هده المجموعة قد احتاجو فيما بعد الى عملية ثانية لبزل النزف المتكرر.
15 مريض, 11(73%) دكور و 4(27%) اناث تم بزل النزيف بعد تثقيب الجمجمة وغسل التجويف المتبقي بالسائل الملحي الفسلجي مع وضع انبوب تصريف بعد العملية فقط اثنان (13%) من هده المجموعة احتاجو الى عملية ثانية لبزل النزف المتكرر.
من هده النتائج والقيمة الاحصائية المستعملة نستنتج انه لا يوجد فرق ملحوظ بين المجموعتين.

Abstrcact

Background:
Chronic subdural hematoma is a collection of liquefied blood between the dura and arachnoid layer of the brain which thought to result from injury to bridging veins crossing the subdural space. Patients with chronic subdural haematomas can present in a variety of ways, and symptom onset and progression may range from days to weeks. Surgical approach with standard methods is still controversial.

Objective: to compare patients outcome following two surgical approaches with or without closed system drainge.

Patients and methods: The present prospective cohort study included 40 patients with subdural hematoma throughout the period extending from January 2010 to August 2014. Two bur hole craniostomies (12 mm in diameter) were made in each patients; one in front of the coronal suture and the other behind the hematoma and the procedure was done without membranectomy. In 15 cases, closed system drainage was placed into the hematoma cavity for an average of 2 days (1 to 3 days) after irrigation with physiologic saline solution.

Results: The outcome after operation was as following: 5 out of 25 patients in the first group needed re-operation accounting for a rate of (20%). The rate was slightly lower in the second group; 2 out of 15 (13.3%). The difference in rate of re-operation was not significant (P> 0.05)

Conclusion: The use of subdural closed drainage system is not superior to drainage and simple closure in treatment of chronic subdural hematoma.

Key words: re-operation, chronic subdural hematoma

Introduction

CSDH is a collection of liquefied blood between the dura and arachnoid layer of the brain thought to result from injury to bridging veins crossing the subdural space [(1)]. Patients with chronic subdural haematomas can present in a variety of ways, and symptom onset and progression may range from days to weeks. Elderly patients frequently present with multiple symptoms that may mimic a stroke or rapidly progressive dementia. In a study of 1000 patients with CSDH, their presenting symptoms included behavioural disturbance (28.5 %), headaches (25.1 %), and limb weakness (24.8 %); behavioural disturbance

was the predominant clinical feature in elderly patients [2]. Many patients have a mild reduction in their level of consciousness (Glasgow Coma Scale [GCS] score of 13–15), but elderly patients with CSDH do not typically present in coma [3, 4]. Bilateral subdural haematomas may be present in up to 25 % of patients, but without causing focal neurological deficits [5, 6]. Midline shift may be minimal with bilateral CSDH, but the haematomas can still exert significant mass effect. This may increase the risk of rapid deterioration, so consideration may be given to expedited surgical drainage in these patients [2].

Head injury is a common risk factor and in a study of 1000 patients, 61.7 % recalled a recent one [1]. Other risk factors include coagulopathy, use of antiplatelet or anticoagulant medication, over-drainage from a cerebrospinal diversion device, haematological malignancies and vascular malformations [7]. A more important prerequisite is sufficient potential subdural space that is aging, degeneration of the brain [8]. Other risk factors include alcohol abuse and seizures [9, 10].

CSDH was considerd a stroke in 17th century [11] and inflammation in 19th century, and it became a traumatic lesion in 20th century [12]. CSDHs often present several weeks or months after the index bleed, because as the initial acute haematoma liquefies it enlarges. This increasing volume causes mass effect that manifests clinically. Two principal theories have been proposed for the mechanism of clot enlargement. Firstly, that the liquefying clot has increased protein content exerting an osmotic effect through increased oncotic pressure. However, the osmolality of the liquefied clot is actually the same as cerebrospinal fluid and blood [2]. A second theory states that recurrent bleeding occurs from abnormal and dilated blood vessels in the capsule that forms around the haematoma. Evidence from radiolabelling studies and observation of coagulation abnormalities within the CSDH itself support this theory [5]. High concentrations of vascular endothelial growth factor (VEGF) have also been demonstrated within the subdural fluid supporting the theory that ongoing angiogenesis and hyper-permeability of capillaries contributes to haematoma expansion [5]. Now, it would be reasonable that in the aged persons, degeneration of brain might play the most important role in development of CSDH [8].

Surgical haematoma evacuation is indicated in patients who deteriorate or do not improve. Surgery can bring a rapid clinical improvement with a favourable outcome in over 80 % of patients However, the most effective surgical technique is uncertain. The three most common techniques are twist-drill craniotomy (TDC), burr hole craniotomy (BHC) and craniotomy [2].

During surgical evacuation of a CSDH, opening of the dura to release the haematoma often reveals that the collection was under tension One study of 247 patients demonstrated a significant reduction in recurrence rates when more than 1500 ml of irrigation fluid is used [13]. The most evidence-based adjunct to surgical haematoma evacuation is placement of a post-operative drain. A randomised controlled trial (RCT) demonstrated that subdural drains left in situ after BHC reduced CSDH recurrence requiring re-drainage (9·3 vs. 24·0 % recurrence with/without drain) [14].

Patients and methods

The present prospective cohort study included 40 patients with subdural hematoma throughout the period from January 2010 to August 2014. The study was carried out in the department of neurosurgery at Al-Deewaniyah teaching hospital/ Al-Deewaniyah province / Iraq. The patients age ranged from 20 to 85 years and included 26 males and 14 females. Patients were diagnosed as having subduarl hematoma by CT-scan examination. The Subdural hematoma was identified, at time of operation, as hematoma surrounded by capsule) and consisting of dark reddish liquefied blood at operation. Operation was done under local anesthesia, with the number

of bur hole determined by number, size and location of hematoma as shown by CT-scan. Two bur hole craniostomy (12 mm in diameter) were made in each patients; one in front of the coronal suture and the other behind the hematoma and the procedure was done without membranectomy. In 15 cases, closed system drainage was placed into the hematoma cavity for an average of 2 days (1 to 3 days) after irrigation with physiologic saline solution.

Statistical analysis was carried out using SPSS version 22.0. Numeric variables were presented as mean, range and standard deviation while categorical variables were expressed as number and percentage. Chi-square test was used to study association between any two categorical variables. P-value was considered significant when it was equal or less than 0.05.

Results

The present study involved 40 patients; 26 of them were males (65.0%) while the rest 14 were females (35.0%). Mean age 55 ± 3.8 years and it ranged from 20 to 85 years. According to approach of surgery patients were categorized into two groups; the first group (Group 1) were treated by bur hole and irrigation and the second group (Group 2) were treated by bur hole and drainage. The first group included 15 males (60.0%) and 10 females (40.0%); the second group included 11 males (73.3%) and 4 females (26.7 %).

The causes of subdural hematoma were as following: head trauma was seen in 25 patients (60.0%); Coagulopathy in 14 patients (37.5%) and in one patients the cause was shunt (2.5%).

The outcome after operation was as following: 5 out of 25 patients in the first group needed re-operation accounting for a rate of (20%). The rate was slightly lower in the second group; 2 out of 15 (13.3%). The difference in rate of re-operation was not significant (P> 0.05), as shown in table 1.

Table 1: Outcome in patients treated for subdural hematoma

Outcome	Group 1	Group 2	Total	χ^2	P
Re-operation	5 (20.0)	2 (13.3)	7 (17.5)	0.289	0.591*
No re-operation	20 (80.0)	13 (86.7)	33 (82.5)		
Total	25 (100.0)	15 (100.0)	40 (100.0)		

* Not significant at a level of ≤ 0.05; the first group (Group 1) were treated by bur hole and irrigation and the second group (Group 2) were treated by bur hole and drainage

Discussion

Although chronic subdural hematoma is well known as a curable disease in the adult and in the elderly, the rate of reoperation varies between 2.7 up to 30% [15]. In the previous years, a number of surgical procedures have been adopted; nevertheless, the extent of surgical approach is still controversial [16]. Two surgical approaches are routinely carried out in our department, bur hole evacuation without membranectomy and bur hole evacuation with intra-hematoma drain. Some authors advised for extended craniotomy for better exposure and facilitated handling with the solid component of hematoma [17]. In the present study bur hole drainage without closed drain was carried out in 25 cases and bur hole with closed drain for 2 days was done in 15 patients. Improvement was recorded in all patients regardless of the type operation. According to Markwalder classification [16], patients in the current study were classified, post-operatively into grade 0 and grade 1. The rate of reoperation, in our study was 17.5% in all patients and was higher in the first group " bur hole without

drainage" in comparison with the second group "bur hole with drainage", 20% versus 13.3%; however, the difference in rate did not reach a statistical significance (P>0.05). it is proposed that the development and enlargement of CSDH is the result of local hyper fibrinolysis with resultant liquefaction and continuous micro-hemorrhage from sinusoidal vessels of the parietal membrane [18]. For that reason, complete evacuation together with irrigation -drainage of subdural hematoma using normal saline is far more important than partial resection of the membrane. Histological studies revealed that CSDH passes through stages of proliferative and degenerative stages [17]. Some authors reported recurrence and re-operation in the proliferative stage. In accordance with these observation, we demonstrated that patients who underwent re-operation had presented about 4 weeks, on average, after the onset of head injury, a time corresponding to the proliferative stage of hematoma; and on the contrary patients who were presented later on, did not need further operations. The present study showed that recurrence rate was higher in older age patients and patients with coagulopathy and these findings are in accordance with the findings of several other authors [5]. It has been stated that age more than 65, coagulopathy, post-operative persistence of subdural air and cerebral infarction are poor prognostic factors [20]. Consistent with our observation, Shameem Ahmed et al and Markwlader et al [19,21], found no advantage of using subdural drain over simple drain.

In conclusion, the use of subdural drain is not superior to simple one time drain in treatment of chronic subdural hematoma.

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