

小骨窗及常规骨瓣清除硬膜外血肿的前瞻性随机对照研究

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【摘要】 共 95 例急性硬膜外血肿并早期脑疝形成患者随机行小骨窗(44 例)或常规去骨瓣(51 例)血肿清除术。结果显示,小骨窗组患者手术时间短($P = 0.000$),术中出血量($P = 0.000$)和输血量($P = 0.031$)少;而两组术后残留血肿量($P = 0.141$)、清醒时间($P = 0.201$)、大面积脑缺血($P = 0.865$)和脑水肿($P = 0.879$)发生率,以及术后 6 个月时 Glasgow 预后分级($P = 0.603$)差异均无统计学意义。表明小骨窗血肿清除术可有效清除血肿并解除脑疝,其手术效果及预后与常规去骨瓣减压血肿清除术无明显差异,且具有手术时间短、术中出血量和输血量显著减少等优点。

【关键词】 血肿,硬膜外,颅内; 脑疝; 颅骨切开术

Prospective randomized controlled study on small - window craniotomy versus ordinary large-window craniotomy in the evacuation of epidural hematoma

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【Abstract】 There is still controversy on the clinical efficacy of small-window craniotomy (SWCT) for acute epidural hematoma with concurrent early-phase cerebral herniation. This study compared multiple surgical and prognostic parameters of SWCT versus ordinary large-window craniotomy (LWCT), which aimed at providing evidences for surgical decision. Compared with LWCT ($N = 51$), SWCT ($N = 44$) displayed shortened average operation time ($P = 0.000$), reduced intraoperative blood loss ($P = 0.000$) and lessened intraoperative blood transfusion ($P = 0.031$). Moreover, there was no differences of postoperative residual hematoma ($P = 0.141$), postoperative palinesthesia time ($P = 0.201$), the ratio of postoperative secondary ischemia ($P = 0.865$) or cerebral edema ($P = 0.879$), and 6-month Glasgow Outcome Scale (GOS) score ($P = 0.603$) between the two surgical approaches. Results suggested that, for patients with acute epidural hematoma and concurrent early-phase cerebral herniation, SWCT could effectively evacuate hematoma and relief brain herniation without significant differences of effect and prognosis from LWCT. In addition, SWCT has several advantages such as significantly reduced operation time, intraoperative blood loss and blood transfusion.

【Key words】 Hematoma, epidural, cranial; Encephalocele; Craniotomy

目前开颅血肿清除术是治疗急性硬膜外血肿的传统术式^[1]。对于硬膜外血肿并脑疝形成的患者一般行去骨瓣减压血肿清除术,而早期形成脑疝者多无需采用该术式。针对这一特点,我们采用小骨窗血肿清除术治疗硬膜外血肿并早期脑疝形成患

者,取得较为满意的治疗效果。

资料与方法

一、研究对象

1. 病例选择 (1)单纯幕上急性硬膜外血肿致早期脑疝形成,仅单侧瞳孔扩大。(2)血肿长径 ≤ 12 cm、脑疝形成时间 ≤ 90 min。(3)手术前休克持续时间 < 30 min 并且 Glasgow 昏迷量表(GCS)评分 ≥ 6 分。(4)排除以下情况:合并严重心、肺疾病

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或糖尿病;合并其他脏器严重损伤;巨大型硬膜外血肿且血肿长径 > 12 cm;考虑脑膜中动脉主干近颞底部急性活动性出血;跨窦骨折活动性出血;多发性广泛性粉碎性骨折伴硬膜外血肿。

2. 一般资料 选择 2009 年 1 月-2013 年 5 月在解放军第一七五医院神经外科住院治疗的急性硬膜外血肿并早期脑疝形成患者共 95 例,男性 64 例,女性 31 例;年龄 16.20 ~ 62.33 岁,平均(36.92 ± 16.24)岁。按照随机数字表法随机分为小骨窗治疗组(小骨窗组)和常规“∩”形皮瓣骨窗治疗组(常规组)。两种手术方式均遵守医疗技术操作原则,并获得我院临床伦理委员会批准,所有患者均经家属签署知情同意书。

二、手术方法

1. 小骨窗组 取直切口或“S”形切口、长度 5 ~ 8 cm,形成小骨窗,骨窗长径为 3 ~ 5 cm。其中,血肿长径 < 8cm 者采用直切口,长度 5 ~ 7 cm,骨瓣长径约 3 cm;血肿长径 8 ~ 12 cm 者采用“S”形切口,长度 7 ~ 8 cm、宽度 2 ~ 2.50 cm,骨瓣长径 4 ~ 5 cm。于全身麻醉下施行开颅血肿清除术,电动环钻^[2]或气动钻铣刀形成圆形小骨窗,骨瓣以血肿最厚部位为中心,适当包括骨折线,颅骨骨折处出血以骨蜡止血,悬吊硬脑膜时尽可能严密,多可达到止血效果。对于硬脑膜张力高或硬脑膜下发蓝患者,可于硬脑膜上切一小口,探查硬膜下隙有无血肿,若发现活动性出血,适当延长手术切口并扩大骨窗,剪开硬脑膜彻底止血,颅内压基本恢复正常者即可回纳骨瓣;若未出现上述情况,则可直接回纳骨瓣,头皮下放置引流管^[3]。术后动态复查 CT 以了解血肿清除情况、中线和环池结构,并了解有无继发性脑出血,以及脑缺血和脑水肿等并发症。

2. 常规组 采取“∩”形皮瓣切口,切口和骨窗大小根据血肿范围设计,按照常规手术操作程序清除血肿,术后检查同小骨窗组。

3. 疗效评价 (1)手术效果评价:对两组患者手术时间、术中出血量和输血量,以及术后残留血肿量、清醒时间、继发脑缺血和脑水肿等项指标进行评价。(2)远期神经功能评价:术后 6 个月时,采用 Glasgow 预后分级(GOS)评价两组患者预后,分为恢复良好(5分)、中残(4分)、重残(3分)、植物状态生存(2分)和死亡(1分)。

三、统计分析方法

采用 SPSS 13.0 统计软件进行数据计算与分

表 1 小骨窗组与常规组患者社会人口学特征和临床资料的比较*

Table 1. Comparison of sociodemographic characteristics and clinical features of patients in 2 groups*

Item	LWCT (N=51)	SWCT (N=44)	χ^2 or <i>t</i> value	<i>P</i> value
Sex case (%)			0.025	0.875
Male	34 (66.67)	30 (68.18)		
Female	17 (33.33)	14 (31.82)		
Age ($\bar{x} \pm s$, year)	37.00 ± 14.40	36.80 ± 15.80	-0.065	0.949
Midline shift ($\bar{x} \pm s$, mm)	13.50 ± 2.10	12.40 ± 3.70	-1.812	0.073
Volume of hematoma ($\bar{x} \pm s$, ml)	86.70 ± 21.90	82.40 ± 18.30	-1.209	0.306
Maximal diameter of hematoma ($\bar{x} \pm s$, cm)	8.70 ± 1.10	8.80 ± 1.10	0.442	0.660
Location case (%)	38 (74.51)	34 (77.27)	0.098	0.754
GCS ($\bar{x} \pm s$, score)	9.50 ± 2.90	10.00 ± 1.70	1.004	0.318
Duration of brain herniation ($\bar{x} \pm s$, min)	56.70 ± 18.70	57.20 ± 5.60	0.140	0.889

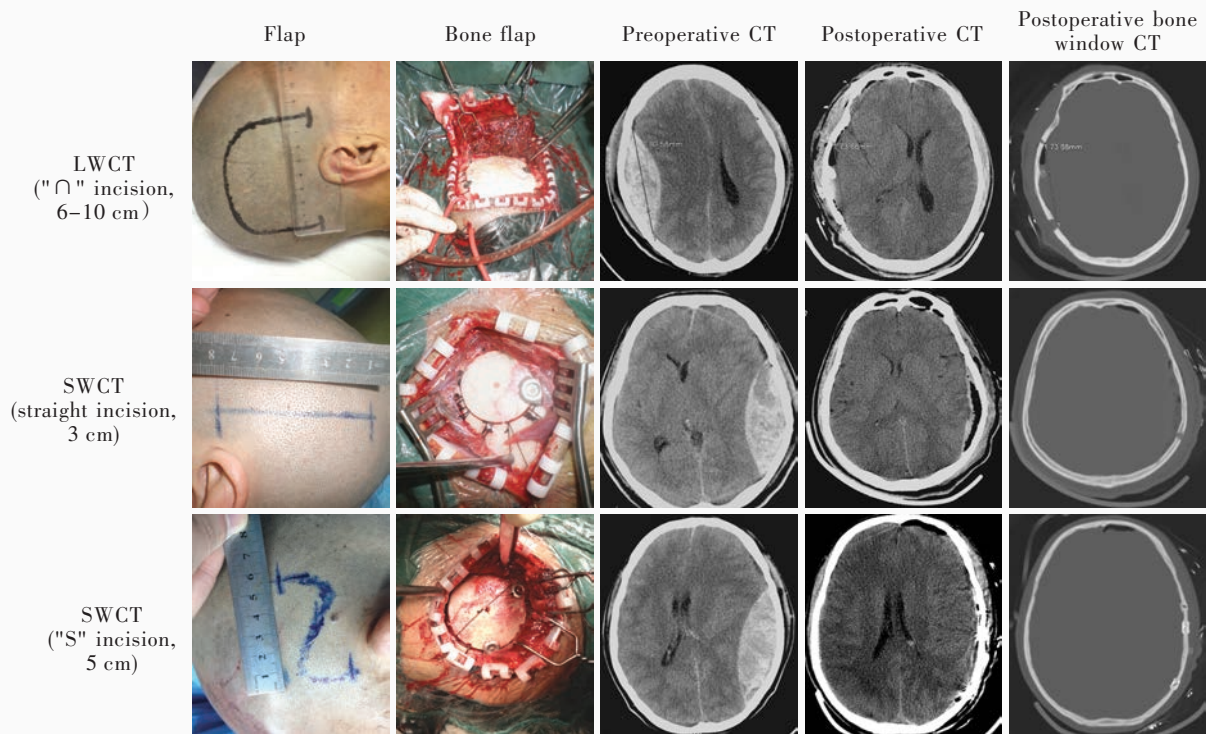
* χ^2 test for comparison of sex and location, and *t* test for comparison of others. LWCT, large-window craniotomy, 大骨窗血肿清除术; SWCT, small-window craniotomy, 小骨窗血肿清除术; GCS, Glasgow Coma Scale, Glasgow 昏迷量表

析。计量资料以均数 ± 标准差($\bar{x} \pm s$)表示,行两独立样本的 *t* 检验。计数资料以相对数构成比(%)或率(%)表示,术后 6 个月时 GOS 分级的比较采用秩和检验;术后大面积脑缺血和脑水肿发生率的比较,行四格表校正 χ^2 检验。以 *P* ≤ 0.05 为差异具有统计学意义。

结 果

根据病例选择标准,小骨窗组共 44 例患者,男性 30 例,女性 14 例,年龄 3 ~ 69 岁,平均(36.80 ± 15.80)岁;常规组共计 51 例患者,男性 34 例,女性 17 例,年龄 10 ~ 70 岁,平均(37.00 ± 14.40)岁。两组患者社会人口学特征和临床资料比较,差异无统计学意义(均 *P* > 0.05,表 1),均衡可比。具体手术情况参见图 1。

手术效果评价显示,与常规组相比,小骨窗组患者手术时间缩短(*P* < 0.01)、术中出血量和输血量减少(*P* < 0.05);而术后残留血肿量、清醒时间、大面积脑缺血和脑水肿发生率组间差异均无统计学意义(*P* > 0.05,表 2)。远期神经功能评价显示,小骨窗组恢复良好者 41 例、中残 3 例,常规组为 46 和 5 例,组间差异无统计学意义(*Z* = -0.520, *P* = 0.603);两组均无重残、植物状态生存和死亡病例。



LWCT, large-window craniotomy, 大骨窗血肿清除术; SWCT, small-window craniotomy, 小骨窗血肿清除术

图 1 常规“∩”形切口和小骨窗直切口或“S”形切口血肿清除术的手术和影像学资料,其中术后 CT 复查均于术后 6 h 内完成

Figure 1 Representative radiographic images of conventional craniotomy by "∩"-shaped incision and small-window craniotomy by straight or "S"-shaped incision for surgical evacuation of acute epidural hematoma. As shown in the pictures, all the postoperative CT reexaminations were performed within 6 h after surgery.

表 2 小骨窗组与常规组患者手术效果的比较*

Table 2. Comparison of surgical and prognostic parameters between 2 groups*

Item	LWCT (N = 51)	SWCT (N = 44)	t or adjusted χ^2 value	P value
Operation time ($\bar{x} \pm s$, min)	129.60 ± 22.90	70.20 ± 9.20	-16.111	0.000
Volume of intraoperative blood loss ($\bar{x} \pm s$, ml)	357.80 ± 130.50	222.70 ± 119.30	-5.234	0.000
Volume of intraoperative blood transfusion ($\bar{x} \pm s$, ml)	96.10 ± 157.40	36.40 ± 96.70	-2.184	0.031
Volume of postoperative residual hematoma ($\bar{x} \pm s$, ml)	4.40 ± 5.80	6.00 ± 4.50	1.484	0.141
Postoperative palinesthesia time ($\bar{x} \pm s$, d)	1.50 ± 0.80	1.30 ± 0.70	-1.287	0.201
Ratio of postoperative massive cerebral infarction case (%)	3 (5.88)	2 (4.55)	0.029	0.865
Ratio of postoperative massive encephaledema case (%)	5 (9.80)	3 (6.82)	0.023	0.879

*Adjusted χ^2 test for comparison of postoperative massive cerebral infarction and massive encephaledema, and t test for comparison of others

讨 论

急性硬膜外血肿占外伤性颅内血肿 21.50% ~ 70%^[4],其发生机制与颅骨线形骨折密切相关^[5]。位于骨沟内的硬脑膜中动脉或静脉窦等部位出血十分凶险,若不及时治疗易继发脑疝形成^[6]。但是由于血肿位于脑实质外,对脑组织和血管的损伤仅

表现为机械性压迫作用,及时清除血肿后大多数患者可获得良好预后^[7]。因此,对于硬膜外血肿致早期脑疝形成的患者可采用 I 期骨瓣回纳,若术后继发血肿或出现大面积脑缺血、脑水肿可再次行 II 期减压术,避免因不必要的去骨瓣减压导致的远期并发症^[8]及后期颅骨修补造成的损伤^[9]。

本研究结果显示,小骨窗组患者术后残留血肿

量、清醒时间、大面积脑缺血和脑水肿及远期神经功能与常规组之间无显著性差异,但手术时间缩短、术中出血量和输血量明显减少,与以往研究结果相一致^[10-11]。直切口或“S”形切口小骨窗血肿清除术要点为:(1)术前了解骨折线情况、判断出血来源。(2)术前钻孔吸除部分血肿,可快速降低颅内压并在一定程度上缓解脑疝,为外科手术争取时间,有利于 I 期骨瓣回纳^[12-13]。(3)血肿长径 < 8 cm 者,采取直切口,长度 5~7 cm,骨瓣长径约 3 cm;血肿长径 8~12 cm 者,采取“S”形切口、长度 7~8 cm、宽度 2~2.50 cm、骨瓣长径 4~5 cm。(4)清除血肿不必太彻底^[14],可残留边缘薄层血肿,以免剥离硬脑膜后造成新的出血。(5)硬脑膜悬吊须严密^[15]。小骨窗血肿清除术对硬脑膜悬吊要求较高,严密硬脑膜悬吊可有效止血,且悬吊时小圆针与持针器倾斜 150°~180°,尽可能悬吊血肿边缘硬脑膜,暂不打结,待四周悬吊完毕(一般悬吊 4~6 针),于血肿边缘覆盖少量明胶海绵后一并打结,最后于两根悬吊线之间近骨窗缘再悬吊一针加固。值得注意的是:(1)若出血点未在视野范围内,尤其是硬脑膜中动脉和静脉窦活动性出血,可以适当向出血部位延长切口并扩大骨窗,显露出血点予以电凝、悬吊或压迫止血。(2)对于前颅底硬膜外血肿,小的直切口难以显露至前颅底,应延长切口 3~4 cm 或采用“S”形切口。

综上所述,只要合理选择病例、严格掌握手术适应证,直切口或“S”形切口小骨窗血肿清除术治疗硬膜外血肿并早期脑疝形成是切实可行的,值得在临床应用和推广。

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下期内容预告 本刊 2014 年第 6 期报道专题为代谢性肌病临床研究,重点内容包括:加强我国代谢性肌病的早期诊断与治疗;代谢性肌病电生理学研究进展;原发性周期性麻痹基因诊断与治疗进展;核黄素反应性脂质沉积性肌病临床特征与基因突变分析;两家系三例报告并文献复习;核黄素反应性脂质沉积性肌病治疗前后肌肉病理比较:一例报告并文献复习;家族性低钾型周期性麻痹基因型和表型分析;呈急性轴索性运动感觉神经病样表现的线粒体脑肌病二例:临床病理和基因突变分析