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超声引导下经皮经肝胆囊穿刺置管引流术对高危急性胆囊炎患者炎症反应和肝功能的影响*

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摘要 目的:探讨超声引导下经皮经肝胆囊穿刺置管引流术(PTGD)治疗高危急性胆囊炎的疗效及对患者炎症反应和肝功能的影响。**方法:**选取2016年10月~2018年12月期间内蒙古医科大学附属医院收治的高危急性胆囊炎患者160例为研究对象,根据数字表法将患者随机分为对照组(n=80)和研究组(n=80),对照组给予胆囊造瘘术治疗,研究组给予超声引导下PTGD治疗,比较两组患者治疗后临床疗效、炎症反应以及肝功能指标变化情况,记录两组术后并发症发生情况。**结果:**研究组有效率高于对照组,住院时间短于对照组($P<0.05$)。对照组术后3 d、术后5 d以及研究组术后1 d、术后3 d、术后5 d白细胞计数、中性粒细胞百分比、C反应蛋白(CRP)水平均较术前降低($P<0.05$);研究组术后1 d、术后3 d、术后5 d白细胞计数、中性粒细胞百分比、CRP水平均低于对照组($P<0.05$)。两组患者术后1 d、术后3 d、术后5 d丙氨酸转氨酶(ALT)、总胆红素(TB)水平均较术前下降,且研究组低于对照组($P<0.05$)。研究组术后并发症总发生率低于对照组($P<0.05$)。**结论:**超声引导下PTGD治疗高危急性胆囊炎,疗效确切,可有效减轻机体炎症反应、肝损伤,同时还可减少术后并发症发生率,具有较高的临床应用价值。

关键词:经皮经肝胆囊穿刺置管引流术;高危;急性胆囊炎;疗效;炎症反应;肝功能

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Effect of Ultrasound-guided Percutaneous Transhepatic Gallbladder Drainage on Inflammatory Response and Liver Function in Patients with High-Risk Acute Cholecystitis*

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ABSTRACT Objective: To investigate the efficacy of ultrasound-guided percutaneous transhepatic gallbladder drainage (PTGD) in the treatment of high-risk acute cholecystitis and its effect on inflammatory response and liver function in patients. **Methods:** 160 patients with high-risk acute cholecystitis who were admitted to the Affiliated Hospital of Inner Mongolia Medical University from October 2016 to December 2018 were selected as the research objects. According to the digital table method, the patients were randomly divided into control group (n=80) and study group (n=80). The control group was treated with biliary fistula, and the study group was treated with PTGD under the ultrasound-guided. The clinical efficacy, inflammatory response and liver function indexes of the two groups were compared after treatment. The complications of the two groups were recorded. **Results:** The effective rate of the study group was higher than that of the control group, and the hospitalization time was shorter than that of the control group ($P<0.05$). The leucocyte count, neutrophil percentage and C-reactive protein (CRP) in the control group at 3 d after operation, 5 d after operation and the study group at 1 d after operation, 3 d after operation, 5 d after operation were all lower than those before operation ($P<0.05$). The leucocyte count, neutrophil percentage and CRP in the study group at 1 d after operation, 3 d after operation, 5 d after operation were lower than those in the control group ($P<0.05$). The levels of alanine aminotransferase (ALT) and total bilirubin (TB) in the two groups at 1 d after operation, 3 d after operation, 5 d after operation were decreased before operation, and those in the study group were lower than those in the control group ($P<0.05$). The total incidence rate of postoperative complications in the study group was lower than that in the control group ($P<0.05$). **Conclusion:** Ultrasound-guided PTGD is effective in the treatment of high-risk acute cholecystitis. It can effectively alleviate inflammatory reaction and liver injury, and reduce the incidence of postoperative complications. It has high clinical value.

Key words: Percutaneous transhepatic gallbladder drainage; High-risk; Acute cholecystitis; Efficacy; Inflammatory response; Liver function

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前言

急性胆囊炎是由细菌侵袭和胆囊管梗阻所引发,以右上腹阵发性绞痛为主要表现,并伴有腹肌强直和明显的触痛^[1,2]。该病可造成消化系统损害,严重者可引起多脏器功能衰竭,危及患者生命^[3]。高危急性胆囊炎发病时病理改变较重,且多为化脓性,临床上常采用保守治疗,但效果往往不佳,故需手术予以干预治疗^[4],但又因高危患者合并的基础性疾病较多,对腹腔镜手术或急诊开腹时的麻醉及术中刺激耐受性差,手术风险较大^[5]。因此,高危急性胆囊炎患者的处理措施一直是临床亟待解决的问题。经皮经肝胆囊穿刺置管引流术(Percutaneous transhepatic gallbladder drainage, PTGD)是指经右上腹穿刺到肝脏,然后经胆囊穿刺进入胆囊内,最终将胆汁引出体外的一种微创治疗方式,可迅速缓解临床症状、控制感染^[6,7]。本研究探讨 PTGD 治疗高危急性胆囊炎的疗效及对患者炎症反应和肝功能的影响,以期为该病的治疗提供参考。研究如下。

1 资料与方法

1.1 临床资料

选取内蒙古医科大学附属医院于 2016 年 10 月~2018 年 12 月期间收治的高危急性胆囊炎患者 160 例为研究对象,本次研究已获取我院伦理委员会批准进行。纳入标准:(1)符合《急性胆道系统感染的诊断和治疗指南(2011)版》^[8]中的相关诊断标准;(2)CT 或 B 超显示胆囊伴有不同程度肿大,囊壁水肿,经保守治疗症状未见明显缓解者;(3)患者及其家属知情本研究且已签署了同意书。排除标准:(1)合并恶性肿瘤、重要脏器功能不全者;(2)合并全身严重感染者;(3)病历资料不全者;(4)合并精神疾患无法配合本次治疗者。根据数字表法将患者随机分为对照组(n=80)和研究组(n=80),其中对照组男 43 例,女 37 例,年龄 39~64 岁,平均(49.82±4.36)岁;合并症:高血压 8 例,糖尿病 13 例,心脏疾病 7 例,肺部疾病 9 例。研究组男 45 例,女 35 例,年龄 38~66 岁,平均(50.29±4.08)岁;合并症:高血压 7 例,糖尿病 12 例,心脏疾病 9 例,肺部疾病 8 例。两组患者一般资料比较无差异($P>0.05$),存在可比性。

1.2 方法

所有患者入院后给予补液、饮食干预、止痛、抗感染、解痉等基础治疗,在此基础上,对照组给予胆囊造瘘术治疗,全麻,患者取仰卧位,于腹正中旁线作一切口,长约 10 cm,将引流管放置于胆囊中,缝合切口,术后给予常规抗感染、静脉营养等对症支持治疗。研究组给予 PTGD 治疗,具体如下:全麻,患者取仰卧位,采用超声仪对患者胆囊大小、位置及周围器官进行探查,在超声引导下,经肝脏将穿刺针置入胆囊体部,在 B 超的引导下采用 18 G 穿刺针进行穿刺,胆汁抽取后,将导丝置入胆囊,退出穿刺针,沿导丝送入 7~8.5 F 猪尾样导管,并刺入胆囊,释放外套管,妥善固定,缝合体表。术后给予常规抗感染、半流质、低脂食物等对症支持治疗。

1.3 观察指标

(1)观察两组患者术后临床疗效、住院时间,其中疗效判定标准^[9]如下:无效:术后患者病情加重;有效:术后患者腹痛症状改善明显,引流液转为清亮,术后 2 d 各项临床症状基本消失。(2)于术前、术后 1 d、术后 3 d、术后 5 d 抽取患者肘静脉血 3 mL,2900 r/min 离心 12 min,离心半径 10 cm,取上清液,置于 -30 摄氏度冰箱中待测。采用 SE9000 血液计数仪测定白细胞计数、中性粒细胞百分比,采用免疫比浊法检测 C 反应蛋白(C-reactive protein, CRP)水平,严格遵守试剂盒(深圳晶美生物科技有限公司)说明书进行操作。采用日本奥林巴斯公司生产的 AU2700 全自动生化分析仪检测肝功能指标:总胆红素(Total bilirubin, TB)、丙氨酸转氨酶(Alanine aminotransferase, ALT)。(3)观察两组患者术后并发症。

1.4 统计学方法

采用 SPSS 23.0 软件处理分析数据,采用($\bar{x} \pm s$)表示计量资料,行 t 检验;采用[n(%)]表示计数资料,行 χ^2 检验。检验水准为 $\alpha=0.05$ 。

2 结果

2.1 疗效比较

与对照组相比,研究组有效率升高,住院时间缩短($P<0.05$),详见表 1。

表 1 疗效比较
Table 1 Comparison of curative effect

Groups	Effective rate [n(%)]	Hospitalization time(d)
Control group(n=80)	55(68.75)	21.07± 1.94
Study group(n=80)	76(95.00)	16.27± 1.83
χ^2/t	18.573	16.098
P	0.000	0.000

2.2 炎症因子指标比较

两组患者术前白细胞计数、中性粒细胞百分比、CRP 水平比较差异无统计学意义($P>0.05$);对照组术后 3 d、术后 5 d 以及研究组术后 1 d、术后 3 d、术后 5 d 白细胞计数、中性粒细胞百分比、CRP 水平均较术前降低($P<0.05$);研究组术后 1 d、术后 3 d、术后 5 d 白细胞计数、中性粒细胞百分比、CRP 水平均

低于对照组($P<0.05$);详见表 2。

2.3 肝功能指标比较

两组患者术前 ALT、TB 水平比较差异无统计学意义($P>0.05$);两组患者术后 1 d、术后 3 d、术后 5 d ALT、TB 水平均较术前下降,且研究组较对照组低($P<0.05$);详见表 3。

表 2 炎症因子指标比较($\bar{x} \pm s$)
Table 2 Comparison of inflammatory factors($\bar{x} \pm s$)

Groups	Leucocyte count($\times 10^9/L$)				Neutrophil percentage(%)				CRP(mg/L)			
	Before operation	1 d after operation	3 d after operation	5 d after operation	Before operation	1 d after operation	3 d after operation	5 d after operation	Before operation	1 d after operation	3 d after operation	5 d after operation
Control group (n=80)	17.92 $\pm$ 3.17	17.38 $\pm$ 2.13	15.53 $\pm$ 3.14 ^a	12.46 $\pm$ 2.72 ^a	88.51 $\pm$ 6.07	86.53 $\pm$ 7.29	81.29 $\pm$ 6.67 ^a	75.21 $\pm$ 7.41 ^a	197.64 $\pm$ 39.27	187.43 $\pm$ 37.24	164.23 $\pm$ 28.35 ^a	141.38 $\pm$ 31.43 ^a
Study group (n=80)	17.88 $\pm$ 3.18	16.41 $\pm$ 2.21 ^a	13.51 $\pm$ 2.25 ^a	9.37 $\pm$ 3.15 ^a	88.54 $\pm$ 7.35	82.26 $\pm$ 8.15 ^a	76.31 $\pm$ 7.38 ^a	70.14 $\pm$ 6.94 ^a	196.63 $\pm$ 38.22	175.92 $\pm$ 35.37 ^a	143.66 $\pm$ 32.17 ^a	118.52 $\pm$ 32.62 ^a
t	0.080	2.827	4.677	6.641	0.028	3.493	4.478	4.467	0.165	2.324	4.291	4.514
P	0.937	0.005	0.000	0.000	0.978	0.001	0.000	0.000	0.869	0.021	0.000	0.000

Note: Compared with before operation, ^a $P < 0.05$.

表 3 肝功能指标比较($\bar{x} \pm s$)
Table 3 Comparison of liver function indexes($\bar{x} \pm s$)

Groups	ALT(U/L)				TB(μ mol/L)			
	Before operation	1 d after operation	3 d after operation	5 d after operation	Before operation	1 d after operation	3 d after operation	5 d after operation
Control group (n=80)	76.94 $\pm$ 8.90	69.15 $\pm$ 10.09 ^a	57.58 $\pm$ 8.13 ^a	49.47 $\pm$ 8.96 ^a	46.17 $\pm$ 7.81	40.76 $\pm$ 8.31 ^a	34.21 $\pm$ 7.73 ^a	28.45 $\pm$ 6.44 ^a
Study group (n=80)	76.88 $\pm$ 9.34	60.24 $\pm$ 9.25 ^a	49.62 $\pm$ 7.04 ^a	38.19 $\pm$ 7.06 ^a	46.25 $\pm$ 8.92	34.38 $\pm$ 6.27 ^a	27.18 $\pm$ 8.96 ^a	20.23 $\pm$ 5.38 ^a
t	0.042	5.822	6.620	8.845	0.068	5.482	5.314	8.761
P	0.967	0.000	0.000	0.000	0.946	0.000	0.000	0.000

Note: Compared with before operation, ^a $P < 0.05$.

2.4 术后并发症比较

详见表 4。

与对照组相比,研究组术后并发症总发生率较低($P < 0.05$);

表 4 术后并发症情况比较 [n(%)]
Table 4 Comparisons of postoperative complications [n(%)]

Groups	Diarrhea	Pulmonary infection	Incisional infection	Obstructive jaundice	Total incidence rate
Control group (n=80)	6(7.50)	9(11.25)	5(6.25)	4(5.00)	24(30.00)
Study group (n=80)	3(3.75)	5(6.25)	2(2.50)	1(1.25)	11(13.75)
χ^2					3.181
P					0.013

3 讨论

90%的急性胆囊炎由结石引发,其病理生理过程为:细菌入侵胆汁淤积、胆囊管梗阻部位,以致粘膜充血水肿,胆囊全层受病变波及,并进展为化脓性胆囊炎,而持续的梗阻可升高胆囊内压力,影响胆囊壁周围供血障碍,最终造成胆囊坏死、穿孔,短时间内即可出现多脏器功能衰竭或感染性休克,是患者死亡的主要因素^[10-12]。由于人们生活习惯、饮食结构改变较大,导致其发病率呈逐年递增趋势。而高危急性胆囊炎作为临床常见的危重急腹症,该病发病急骤,病情进展迅速,就诊时病情状况严重,全身状况欠佳,极易延误最佳治疗时机^[13-15]。手术作为

高危急性胆囊炎的常用治疗方法,以往胆囊造瘘术可有效改善患者临床症状,但该类手术治疗术后并发症较多,限制其广泛使用^[16-18]。有学者认为^[19]采用其他方式以助患者度过急性期,再择期实施手术,可将手术的风险性降低,且较为安全。PTGD是针对有明显手术禁忌症而不能进行手术或者需行择期手术患者的一类桥接治疗方式,可有效缓解患者临床症状,帮助患者顺利度过急性期^[20,21]。

本次研究中,研究组有效率高于对照组,住院时间短于对照组,可见超声引导下 PTGD 治疗高危急性胆囊炎,疗效显著,可有效促进机体恢复,PTGD 通过微创方法,可迅速引流感染胆汁,减轻胆囊腔内压力,有效避免毒素的再吸收,减轻中毒症

状,缓解机体痛苦;此外,高危急性胆囊炎胆囊体积相对较大,有利于超声定位,同时通过导管行胆囊造影,有利于术者准确掌握胆囊情况并作出及时处理^[22-24]。既往研究表明^[25],高危急性胆囊炎病程中的炎症反应的失控可能是导致患者发生全身炎症综合征或多脏器功能衰竭综合征的主要原因之一。因此,术后有效减轻机体炎症反应可提高患者预后,白细胞计数、中性粒细胞百分比升高均可提示机体处于炎症状态中,而CRP作为急性时相反应蛋白,可反映机体炎症病情严重程度。本研究中研究组术后1 d、术后3 d、术后5 d白细胞计数、中性粒细胞百分比、CRP水平均低于对照组,可见超声引导下PTGD治疗高危急性胆囊炎,可有效控制机体炎症反应,这可能是因为PTGD及时引流胆汁,减少毒素吸收、细菌感染等有关,最终有效减轻机体炎症反应。由于胆囊处的病变炎症可累及周围比邻脏器,而胆囊和肝脏存在特殊的解剖关系,致使高危急性胆囊炎患者常伴有肝脏及肝门组织处明显水肿情况^[26,27]。本研究通过对比两组肝功能指标发现,两组患者术后1 d、术后3 d、术后5 d ALT、TB水平均较术前下降,且研究组低于对照组,可见超声引导下PTGD治疗可有效减轻机体肝损伤,这可能与术中超声引导下具有较好的穿刺定位,针对对肝内血管可有效避开,选择恰当的引流管等原因有关,从而有效减轻机体肝损伤^[28]。此外,研究组术后并发症总发生率低于对照组,这与邓志成等人^[29]研究基本一致。可能是因为PTGD操作简单,可迅速降低胆囊内压力,从而避免急诊手术带来的高风险,同时还可避免保守治疗长时间的禁饮禁食情况,提高机体免疫力,从而有效减少术后并发症发生率^[30]。

综上所述,超声引导下PTGD治疗高危急性胆囊炎,疗效显著,其在改善机体炎症状态、术后并发症发生率等方面效果显著,同时还可减轻肝损伤,临床应用价值较高。

参考文献(References)

- [1] Hirohata R, Abe T, Amano H, et al. Laparoscopic cholecystectomy for acute cholecystitis in a patient with left-sided gallbladder: a case report[J]. Surg Case Rep, 2019, 5(1): 54
- [2] Hjaltadottir K, Haraldsdottir KH, Hannesson PH, et al. Percutaneous cholecystostomy as treatment for acute cholecystitis at Landspítali University Hospital 2010-2016 [J]. Laeknabladid, 2019, 105 (4): 171-176
- [3] Oppenheimer DC, Rubens DJ. Sonography of Acute Cholecystitis and Its Mimics[J]. Radiol Clin North Am, 2019, 57(3): 535-548
- [4] Papis D, Khalifa E, Bhogal R, et al. Is Percutaneous Cholecystostomy a Good Alternative Treatment for Acute Cholecystitis in High-Risk Patients?[J]. Am Surg, 2017, 83(6): 623-627
- [5] Rappold JF. Cholecystectomy reduced major complications vs catheter drainage in high-risk patients with acute cholecystitis [J]. Ann Intern Med, 2019, 170(4): JC22
- [6] Ni Q, Chen D, Xu R, et al. The Efficacy of Percutaneous Transhepatic Gallbladder Drainage on Acute Cholecystitis in High-Risk Elderly Patients Based on the Tokyo Guidelines: A Retrospective Case-Control Study[J]. Medicine (Baltimore), 2015, 94(34): e1442
- [7] Hu YR, Pan JH, Tong XC, et al. Efficacy and safety of B-mode ultrasound guided percutaneous transhepatic gallbladder drainage combined with laparoscopic cholecystectomy for acute cholecystitis in elderly and high-risk patients[J]. BMC Gastroenterol, 2015, 15(7): 81
- [8] 华医学会外科学分会胆道外科学组. 急性胆道系统感染的诊断和治疗指南(2011版)[J]. 中华消化外科杂志, 2011, 10(1): 9-13
- [9] 江培朝, 李玉华, 姬涛, 等. 经皮肝胆囊穿刺引流术联合腹腔镜胆囊切除手术治疗急性重症胆囊炎的临床疗效分析[J]. 中华医院感染学杂志, 2017, 27(11): 2528-2531
- [10] Arias A, Ordieres C, Huergo A, et al. Delayed laparoscopic cholecystectomy in a case of acute cholecystitis and intestinal malrotation type I[J]. Clin Pract, 2019, 9(1): 1091
- [11] Barut B, Gönültaş F, Gök AFK, et al. Management of Acute Cholecystitis During Pregnancy: A Single Center Experience [J]. Ulus Travma Acil Cerrahi Derg, 2019, 25(2): 154-158
- [12] Yoo MC, Yoo SD, Chon J, et al. Acute cholecystitis as a rare and overlooked complication in stroke patients: A retrospective monocentric study[J]. Medicine (Baltimore), 2019, 98(9): e14492
- [13] Oh D, Song TJ, Cho DH, et al. EUS-guided cholecystostomy versus endoscopic transpapillary cholecystostomy for acute cholecystitis in high-risk surgical patients [J]. Gastrointest Endosc, 2019, 89 (2): 289-298
- [14] Zarour S, Imam A, Kouniavsky G, et al. Percutaneous cholecystostomy in the management of high-risk patients presenting with acute cholecystitis: Timing and outcome at a single institution [J]. Am J Surg, 2017, 214(3): 456-461
- [15] Lin WC, Chang CW, Chu CH. Percutaneous cholecystostomy for acute cholecystitis in high-risk elderly patients [J]. Kaohsiung J Med Sci, 2016, 32(10): 518-525
- [16] Zerem E, Omerović S. Can percutaneous cholecystostomy be a definitive management for acute cholecystitis in high-risk patients? [J]. Surg Laparosc Endosc Percutan Tech, 2014, 24(2): 187-191
- [17] Cortázar García R, Sánchez Rodríguez P, Ramos García M. Percutaneous cholecystostomy to treat acute cholecystitis in patients with high risk for surgery[J]. Radiologia, 2016, 58(2): 136-144
- [18] Jang WS, Lim JU, Joo KR, et al. Outcome of conservative percutaneous cholecystostomy in high-risk patients with acute cholecystitis and risk factors leading to surgery [J]. Surg Endosc, 2015, 29 (8): 2359-2364
- [19] 廖重五, 马苏, 宋涛, 等. 腹腔镜胆囊摘除术与传统开腹手术治疗急性胆囊炎的临床疗效对比 [J]. 现代生物医学进展, 2016, 16(26): 5135-5137, 5018
- [20] Jung BH, Park JI. Impact of scheduled laparoscopic cholecystectomy in patients with acute cholecystitis, following percutaneous transhepatic gallbladder drainage [J]. Ann Hepatobiliary Pancreat Surg, 2017, 21(1): 21-29
- [21] 李凯, 许光中, 朱斌, 等. 胆囊穿刺置管引流术在老年急性胆囊炎手术高危患者治疗中的应用 [J]. 中国老年学杂志, 2017, 37(10): 2485-2487
- [22] Yukumi S, Suzuki H, Morimoto M, et al. Thoracic Empyema Caused by Percutaneous Transhepatic Gallbladder Drainage [J]. Intern Med, 2015, 54(24): 3189-3191
- [23] Komatsu S, Tsuchida S, Tsukamoto T, et al. Current role of percutaneous transhepatic gallbladder aspiration: from palliative to curative management for acute cholecystitis [J]. J Hepatobiliary Pancreat Sci, 2016, 23(11): 708-714

- PROSPECT review update[J]. Br J Anaesth, 2018, 121(4): 787-803
- [9] 吴胜,陈金锁,唐晓明,等.腹腔镜及选择性辅助小切口治疗胆囊结石合并肝外胆管结石的临床研究 [J]. 重庆医学, 2015, 44(13): 1807-1808, 1811
- [10] Wan YF, Zhou Y, He C, et al. Cavernous Transformation of the Portal Vein Secondary to Cholecystolithiasis [J]. Chin Med J (Engl), 2018, 131(11): 1373-1374
- [11] Iida T, Kaneto H, Wagatsuma K, et al. Can Trainees Safely Perform Endoscopic Treatments for Common Bile Duct Stones A Single-center Retrospective Study[J]. Intern Med, 2018, 57(7): 923-928
- [12] Liu Z, Zhang L, Liu Y, et al. Efficiency and Safety of One-Step Procedure Combined Laparoscopic Cholecystectomy and Retrograde Cholangiopancreatography for Treatment of Cholecysto-Cholelithiasis: A Randomized Controlled Trial [J]. Am Surg, 2017, 83(11): 1263-1267
- [13] Park Y, Kim D, Lee JS, et al. Association between diet and gallstones of cholesterol and pigment among patients with cholecystectomy: a case-control study in Korea[J]. J Health Popul Nutr, 2017, 36(1): 39
- [14] Sunamak O, Donmez T, Ferahman S, et al. A promising technique for easier single incision laparoscopic cholecystectomy: needle grasper traction of gallbladder[J]. Wideochir Inne Tech Maloinwazyjne, 2018, 13(3): 358-365
- [15] Angelou A, Damaskos C, Garmpis N, et al. An analysis of the iatrogenic biliary injury after robotic cholecystectomy. Current data and future considerations [J]. Eur Rev Med Pharmacol Sci, 2018, 22(18): 6072-6076
- [16] Tayeb M, Rauf F, Bakhtiar N. Safety and Feasibility of Laparoscopic Cholecystectomy in Acute Cholecystitis [J]. J Coll Physicians Surg Pak, 2018, 28(10): 798-800
- [17] Arreaza JA, Tsamalaidze L, Stauffer JA. Laparoscopic Cholecystectomy for Mirizzi Syndrome: Is It Safe?[J]. Am Surg, 2018, 84(4): e141-e143
- [18] Mastalerz K, Kenig J, Olszewska U, et al. The Surgical Apgar Score and frailty as outcome predictors in short-and long-term evaluation of fit and frail older patients undergoing elective laparoscopic cholecystectomy-a prospective cohort study [J]. Wideochir Inne Tech Maloin-
- wazyjne, 2018, 13(3): 350-357
- [19] Upchurch CP, Haas NL, Magnone G, et al. Symptomatic Cholelithiasis of a Remnant Gallbladder after Open Cholecystectomy[J]. J Emerg Med, 2018, 55(3): e71-e73
- [20] Wennmacker SZ, van Dijk AH, Drenth JPH, et al. Statistical analysis plan of a randomized controlled trial to compare a restrictive strategy to usual care for the effectiveness of cholecystectomy(SECURE trial) [J]. Trials, 2018, 19(1): 604
- [21] 闫长红,许艳春.胆囊结石行腹腔镜胆囊切除术对肝功能及应激反应的影响[J].长春中医药大学学报, 2016, 32(1): 171-173
- [23] 周健,张茂,刘德云,等.微量白蛋白与尿肌酐比值及尿 NAG 检测在肾结石微创手术中的应用价值[J].标记免疫分析与临床, 2016, 23(4): 379-381
- [24] Sahay N, Bhadani UK, Guha S, et al. Effect of dexmedetomidine on intracranial pressures during laparoscopic surgery: A randomized, placebo-controlled trial [J]. J Anaesthesiol Clin Pharmacol, 2018, 34(3): 341-346
- [25] Gautam B, Baral B. Spinal Anaesthesia for Laparoscopic Cholecystectomy in Parkinson's Disease [J]. JNMA J Nepal Med Assoc, 2018, 56(211): 701-704
- [26] Ghneim HK, Al-Sheikh YA, Alsheibly MM, et al. Superoxide dismutase activity and gene expression levels in Saudi women with recurrent miscarriage[J]. Mol Med Rep, 2016, 13(3): 2606-2612
- [27] 李斐,赵英歌,李德生,等.双环醇对抗神经病药所致肝损伤脂质过氧化的抑制作用[J].西部医学, 2018, 30(3): 446-448
- [28] Zeng Q, Xue N, Dai D, et al. A Nomogram based on Inflammatory Factors C-Reactive Protein and Fibrinogen to Predict the Prognostic Value in Patients with Resected Non-Small Cell Lung Cancer [J]. J Cancer, 2017, 8(5): 744-753
- [29] Zheng Y, Wang Y, Bai X, et al. Letter to the editor on "The cystic duct and artery were clipped using a clip applier". Nonmetal clip migration after laparoscopic cholecystectomy[J]. Asian J Surg, 2018, 41(6): 585-587
- [30] 马雪,胡占升.腹腔镜胆囊切除术与开腹胆囊切除术治疗老年急性胆囊炎的疗效比较[J].实用医学杂志, 2015, 31(6): 931-932, 933

(上接第 4083 页)

- [24] 陆磊,杨建峰,张筱凤.内镜超声引导下胆管穿刺引流术治疗高危急性胆囊炎的初步应用 [J]. 中华消化内镜杂志, 2017, 34(5): 361-363
- [25] Anderloni A, Buda A, Vieceli F, et al. Endoscopic ultrasound-guided transmural stenting for gallbladder drainage in high-risk patients with acute cholecystitis: a systematic review and pooled analysis [J]. Surg Endosc, 2016, 30(12): 5200-5208
- [26] Yun SH, Park MS, Lee JU, et al. Bedside Endoscopic Ultrasound-guided Transgastric Gallbladder Aspiration and Lavage in a High-risk Surgical Case Due to Acute Cholecystitis Accompanied by Multiorgan Failure[J]. Korean J Gastroenterol, 2015, 65(6): 370-374
- [27] 曹萌,夏雪峰,李强.超声引导下经皮经肝胆囊穿刺置管引流术治疗高危中重度急性胆囊炎疗效观察[J].中华实用诊断与治疗杂志, 2017, 31(9): 906-909
- [28] Wang W, Wang C, Qi H, et al. Percutaneous transcystic balloon dilation for common bile duct stone removal in high-surgical-risk patients with acute cholecystitis and co-existing choledocholithiasis [J]. HPB (Oxford), 2018, 20(4): 327-331
- [29] 邓志成,陈达伟,邹大中.经皮经肝胆囊穿刺引流术治疗高龄高危急性胆囊炎[J].肝胆胰外科杂志, 2017, 29(1): 59-61
- [30] Tsuyuguchi T, Itoi T, Takada T, et al. TG13 indications and techniques for gallbladder drainage in acute cholecystitis (with videos)[J]. J Hepatobiliary Pancreat Sci, 2013, 20(1): 81-88