

· 论 著 ·

老年股骨转子间骨折患者下肢深静脉血栓形成与血流动力学指标的相关性

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摘要: **目的** 探讨老年股骨转子间骨折患者下肢深静脉血栓(deep venous thrombosis, DVT)与血流动力学指标的相关性。**方法** 采用回顾性、抽样研究方法,2014 年 2 月至 2017 年选择在我院诊治的老年股骨转子间骨折患者 172 例作为研究对象,根据 DVT 发生情况分为 DVT 组 40 例与非 DVT 组 132 例,记录两组的血流动力学、血液流变学特征并进行相关性分析。**结果** DVT 组的 DVT 发生于深静脉 10 例,股静脉 20 例,髂骨静脉 10 例。DVT 组的股静脉管径、腘静脉管径的宽度显著大于非 DVT 组,DVT 组的股静脉流速、腘静脉流速显著低于非 DVT 组;DVT 组的全血低切黏度、全血高切黏度、全血中切黏度与 FIB 均显著高于非 DVT 组;DVT 组的 MAP 与 CVP 值显著低于非 DVT 组,HR 值显著高于非 DVT 组,对比差异都有统计学意义($P < 0.05$)。非条件 Logistic 回归法分析显示股静脉流速、腘静脉流速为导致 DVT 的主要危险因素($P < 0.05$);Pearson 相关分析显示 DVT 患者的股静脉流速、腘静脉流速与全血低切黏度、全血高切黏度、全血中切黏度、FIB、MAP 与 CVP 都有显著相关性($P < 0.05$)。**结论** 老年股骨转子间骨折患者 DVT 与血流动力学指标有显著相关性,超声检查与血液流变学指标检测可成为临床防御 DVT 的有效手段。

关键词: 老年人;股骨转子间骨折;下肢深静脉血栓形成;血流动力学;相关性

Correlation between deep venous thrombosis and hemodynamic indexes in the elderly patients with intertrochanteric fractures

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Abstract: Objective To investigate the correlation between deep venous thrombosis(DVT) and hemodynamic indexes in the elderly patients with intertrochanteric fracture. **Methods** A total of 172 elderly patients with intertrochanteric fracture diagnosed and treated in our hospital were selected using a retrospective sampling method from February 2014 to 2017. All the patients were divided into DVT group ($n=40$) and non DVT group ($n=132$) accorded to the occurrence of DVT. The hemodynamic and blood rheology indexes in the two groups were recorded and the correlation was analyzed. **Results** DVT occurred 10 in deep vein, 20 in femoral vein, and 10 in iliac vein in the DVT group. The femoral vein diameter and popliteal vein diameter width in the DVT group were significantly larger than those in non DVT group. The femoral vein and popliteal vein flow velocity were significantly lower than those in non DVT group. The low shear blood viscosity, whole blood viscosity, and FIB were significantly higher than those in non DVT group. MAP and CVP in DVT group were significantly lower than those in non DVT group. HR was significantly higher than that in non DVT group. The differences compared were all statistically significant ($P < 0.05$). Non-conditional logistic regression analysis showed that the femoral vein and popliteal vein flow velocity were the main risk factors of DVT ($P < 0.05$). Pearson correlation analysis showed that femoral vein and popliteal vein flow velocity in DVT patients were significant correlation to low blood viscosity, whole blood viscosity, FIB, MAP, and CVP ($P < 0.05$). **Conclusion** There is significant correlation between DVT and hemodynamic indexes in elderly patients with intertrochanteric fractures. The use of ultrasonography and hemorheology can be effective ways to prevent DVT.

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Key words: Elderly; Intertrochanteric fracture; Deep venous thrombosis of the lower extremities; Hemodynamics; Correlation

下肢深静脉血栓(deep venous thrombosis, DVT)形成是老年股骨转子间骨折患者的并发症之一,在临床上比较常见。有研究显示采取保守治疗的老年股骨转子间骨折患者,DVT 的发生率在 50% 以上;采用手术治疗虽然可使得 DVT 的发生率降低,但是也超过 20%^[1,2]。DVT 可引起肺动脉压力迅速升高导致急性右心功能不全,导致左心排出量骤然降低,诱发患者出现心率加快、血压下降,严重情况下可导致患者死亡^[3,4]。血流缓慢、血管壁损伤、血液高凝状态是 DVT 发生的主要因素,长期卧床、合并糖尿病、血清 D-二聚体水平、血脂水平增高患者更加容易发生 DVT^[5,6]。当前也有研究表明,DVT 发生后,由于肺动脉管腔阻塞导致血流减少或中断,引起不同程度的血流动力学的改变,主要表现为肺血管阻力(pulmonary vascular resistance, PVR)增加,肺动脉压力升高^[7,8]。相比于肺动脉高压正常患者,DVT 所致的动脉高压患者有更高的死亡风险,其治疗方案也不同于肺动脉高压,需要加强针对性治疗^[9,10]。并且血流动力学稳定的 DVT 患者预后多较好;而阻塞主肺动脉而导致泵衰竭或严重低氧血症,可使得患者的死亡率升高^[11,12],不过目前关于 DVT 与股骨

转子间骨折患者血液流变学的相关性报道较少。本文具体探讨了老年股骨转子间骨折患者 DVT 与血流动力学指标的相关性,希望为积极预防 DVT 提供参考。

1 材料和方法

1.1 研究对象

采用回顾性、抽样研究方法,2014 年 2 月到 2017 年选择在我院诊治的老年股骨转子间骨折患者 172 例作为研究对象,根据 DVT 发生情况分为 DVT 组 40 例与非 DVT 组 132 例,纳入标准:入院时患者心、肝、肺、肾功能检测无明显异常;年龄 ≥ 60 岁;影像学(CT/MRI)诊断为股骨转子间骨折;DVT 组符合 DVT 的诊断标准^[11],且有单侧发病;入院前 2 周内无抗凝剂服用史;病历资料完整;研究得到医院伦理委员会的批准。排除标准:既往明确诊断 DVT、合并慢性心力衰竭、免疫风湿性疾病等患者;妊娠与哺乳期患者;精神疾病患者;合并恶性肿瘤患者。两组患者的性别、年龄、红细胞压积(HCT)、体重指数、手术治疗、病程等对比差异无统计学意义($P > 0.05$)。见表 1。

表 1 两组一般资料对比

Table 1 Comparison of general data between the two groups

组别	例数(n)	性别(男/女)	年龄(岁)	HCT(%)	体重指数(kg/m ²)	骨折病程(d)	手术治疗
DVT 组	40	22/18	72.5 $\pm$ 3.3	38.44 $\pm$ 2.49	24.28 $\pm$ 2.19	8.2 $\pm$ 1.3	20
非 DVT 组	132	70/62	72.0 $\pm$ 4.1	39.02 $\pm$ 3.14	24.11 $\pm$ 1.84	8.1 $\pm$ 1.5	60
t 或 χ^2 值		0.424	0.398	0.299	0.194	0.156	0.211
P 值		>0.05)	>0.05	>0.05	>0.05	>0.05	>0.05

1.2 静脉管径和静脉流速测定

采用 GE 公司 Logic700 型超声诊断仪,探头频率 6.5 MHz,在入院后第 2 d 进行检查。患者取仰卧阵位,充分暴露下肢,对 DVT 组下肢发病侧与对应非 DVT 组下肢单侧的股总静脉、股深静脉、股浅静脉、径前静脉进行扫查,测定股静脉、腘静脉的管径与流速,测定三次取平均值。

1.3 血流动力学指标测定

记录与测定患者的心率(heart rate, HR)、平均动脉压(mean arterial pressure, MVP)和中心静脉压(central venous pressure, CVP)等指标,在入院后第 2 d 进行检查。

1.4 血液流变学指标测定

抽取患者空腹静脉血,采用全自动血流变分析

仪(LBY-N6 型)检测患者的全血高切黏度、全血低切黏度、全血中切黏度、纤维蛋白原浓度(fibrinogen, FIB)等指标,在入院后第 2 d 进行检查。

1.5 病历资料调查

为所有患者填写病例观察表以建立个人档案,包括临床情况调查、相关检查等指标,其中临床情况调查包括姓名、性别、年龄、体重、身高、病程等一般情况、基础疾病及相关因素、症状、体格检查、实验室检查(包括血常规、血气分析、凝血、血流动力学等)等。

1.6 统计学处理

选择 SPSS22.00 软件对本次研究数据以及研究所得资料进行分析,计量资料以 $\bar{x} \pm s$ 表示,计数资料以百分数(%)表示,计量数据与计数数据对比采

用 t 检验与卡方分析,相关性分析采用 Pearson 相关分析,采用非条件 Logistic 回归法筛选危险因素,以 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 静脉管径和静脉流速对比

表 2 两组静脉管径和静脉流速对比 ($\bar{x} \pm s$)

Table 2 Comparison of venous diameter and venous flow rate between the two groups ($\bar{x} \pm s$)

组别	例数(n)	股静脉管径(cm)	腘静脉管径(cm)	股静脉流速(cm/s)	腘静脉流速(cm/s)
DVT 组	40	7.68 ± 1.44	6.60 ± 1.46	12.49 ± 2.49	7.68 ± 1.04
非 DVT 组	132	5.89 ± 1.04	5.09 ± 1.09	15.67 ± 1.44	14.29 ± 2.11
t 值		5.683	4.886	7.184	11.752
P 值		< 0.05	< 0.05	< 0.05	< 0.05

2.2 血流动力学指标对比

DVT 组的 MAP 与 CVP 值显著低于非 DVT 组,

DVT 组的股静脉管径、腘静脉管径的宽度显著大于非 DVT 组,DVT 组的股静脉流速、腘静脉流速显著低于非 DVT 组,对比差异都有统计学意义($P < 0.05$)。见表 2。DVT 组的 DVT 发生于下肢深静脉 10 例,股静脉 20 例,髂骨静脉 10 例。

HR 值显著高于非 DVT 组,对比差异有统计学意义($P < 0.05$)。见表 3。

表 3 两组血流动力学指标对比 ($\bar{x} \pm s$)

Table 3 Comparison of hemodynamic indexes between the two groups ($\bar{x} \pm s$)

组别	例数(n)	HR(次/分)	MAP(mmHg)	CVP(cmH ₂ O)
DVT 组	40	88.56 ± 14.55	82.99 ± 7.39	5.61 ± 0.67
非 DVT 组	132	82.19 ± 17.20	86.79 ± 8.14	6.57 ± 0.62
t 值		4.752	5.109	4.995
P 值		< 0.05	< 0.05	< 0.05

2.3 血液流变学指标对比

DVT 组的全血低切黏度、全血高切黏度、全血

中切黏度与 FIB 均显著高于非 DVT 组,对比差异有统计学意义($P < 0.05$)。见表 4。

表 4 两组血液流变学指标对比 ($\bar{x} \pm s$)

Table 4 Comparison of hemorheology indexes between the two groups ($\bar{x} \pm s$)

组别	例数(n)	全血低切黏度(mPa·s)	全血高切黏度(mPa·s)	全血中切黏度(mPa·s)	FIB(g/L)
DVT 组	40	9.26 ± 0.45	4.87 ± 0.34	5.62 ± 0.51	8.86 ± 0.45
非 DVT 组	132	9.00 ± 0.83	4.56 ± 0.56	5.41 ± 0.24	8.10 ± 0.65
t 值		5.835	7.194	4.885	10.421
P 值		< 0.05	< 0.05	< 0.05	< 0.05

2.4 相关性与影响因素分析

以 DVT 作为因变量,以调查与检测的数据内容作为自变量,非条件 Logistic 回归法分析显示股静脉流速、腘静脉流速为导致 DVT 的主要危险因素($P < 0.05$)。见表 5。

表 5 导致 DVT 的主要危险因素 ($n = 172$)

Table 5 The major risk factors for DVT ($n = 172$)

指标	b	Wald	P	Exp(B)	95% CI
股静脉流速	0.867	6.472	0.011	2.495	1.842 - 5.014
腘静脉流速	0.027	5.294	0.021	1.235	1.004 - 1.942

在 DVT 组中,Pearson 相关分析显示股静脉流速、腘静脉流速与全血低切黏度、全血高切黏度、全血中切黏度、FIB、MAP 与 CVP 都有显著相关性(P

< 0.05)。见表 6。

表 6 DVT 患者血流速度与血流流变学、动力学指标的相关性 ($n = 40$)

Table 6 The correlation between blood flow velocity and hemorheology and dynamics in the DVT patients ($n = 40$)

指标	全血低切黏度	全血高切黏度	全血中切黏度	FIB	MAP	CVP
股静脉流速	0.495	0.601	0.477	0.395	0.533	0.435
腘静脉流速	0.502	0.578	0.519	0.442	0.514	0.398

3 讨论

DVT 是老年骨科患者的重要并发症之一,其发生因素包括静脉损伤、血流缓慢和血液高凝状态等^[13]。比如老年股骨转子间骨折端移位或反复复

位牵拉下肢等均可造成静脉损伤,激活血小板或凝血因子 XII,血管内皮细胞受损,启动外源性凝血途径,形成血栓^[14]。许多老年患者在骨折后需要牵引制动患肢,长期卧床使患肢肌肉活动减少,影响静脉回流,肌泵作用减弱或消失,导致血流缓慢。骨折后老年机体出现的内分泌及应激反应、失血等可导致血液成分改变,使细胞增生,血液黏度增高,导致被激活的凝血因子和凝血酶增加,使血液处于高凝状态,从而患者易并发血栓^[15-16]。

DVT 可造成肢体残疾,甚至继发致命性肺栓塞,需要进行早期诊治与预防。根据临床症状预防 DVT 难以达到很好的效果,且 1/4 继发患者以猝死作为首发临床征象,为此临床上大多根据 DVT 发生的危险因素来制定防御措施^[17]。本研究显示 DVT 组的股静脉管径、腘静脉管径的宽度显著大于非 DVT 组,DVT 组的股静脉流速、腘静脉流速显著低于非 DVT 组;DVT 组的全血低切黏度、全血高切黏度、全血中切黏度与 FIB 均显著高于非 DVT 组;DVT 组的 MAP 与 CVP 值显著低于非 DVT 组,HR 值显著高于非 DVT 组,对比差异都有统计学意义 ($P < 0.05$)。其中彩色多普勒超声可发现 DVT 患者在早期下肢静脉的血液淤滞,主要表现为血管管径在宽度上也有增宽与血流速度变慢;并且针对血流信号采用多普勒进行检测的结果具有很高的准确性和可靠性,也能显示出对下肢静脉回心血流障碍,对预防 DVT 起到一定提示作用^[18,19]。同时上述研究也显示股骨转子间骨折的血流动力学不稳与 DVT 的形成相关,MAP、CVP 下降使血流速度变慢,血细胞成分容易沉积在血管壁导致血栓形成^[20,21]。血液呈高黏滞状态也是导致 DVT 的重要原因之一,外伤会引起血管内膜损伤,可导致血液高凝状态,该状态下患者也容易形成静脉血栓;长期抗凝治疗可预防致死性及非致死性静脉血栓栓塞事件的发生,能使肺远期的血流动力学得到更好地改善^[22,23]。

本研究非条件 Logistic 回归法分析显示股静脉流速、腘静脉流速为导致 DVT 的主要危险因素 ($P < 0.05$);Pearson 相关分析显示 DVT 患者的股静脉流速、腘静脉流速与全血低切黏度、全血高切黏度、全血中切黏度、FIB、MAP 与 CVP 都有显著相关性 ($P < 0.05$)。表明下肢静脉血液回流障碍则是引起 DVT 的重要原因之一,股静脉与腘静脉的机械性阻塞可引起解剖学肺血管床的减少,肺血管阻力增大,是导致机体发生血流动力学改变的重要影响因素^[24,25]。血管内皮细胞具有强烈缩血管作用,外在

机械刺激作用于股静脉与腘静脉内压力感受器可引起反射性血管收缩,从而导致股静脉与腘静脉血管阻力增大、流速降低^[26,27]。

总之,老年股骨转子间骨折患者 DVT 与血流动力学指标有显著相关性,超声检查与血液流变学指标检测可成为临床防御 DVT 的有效手段。

【参 考 文 献】

- [1] Li Q, Dai B, Xu J, et al. Can patients with femoral neck fracture benefit from preoperative thromboprophylaxis? A prospective randomized controlled trial [J]. *Medicine (Baltimore)*, 2017, 96(29): e7604.
- [2] 向亮,张卫,贺洪辉,等. 人工关节置换联合粗隆及股骨矩重建治疗高龄股骨粗隆间粉碎性骨折[J]. *中国实用医刊*, 2017, 44(3): 58-61.
Xiang L, Zhang W, He HH, et al. Artificial joint replacement combined with trochanter and femur moment reconstruction for the treatment of intertrochanteric comminuted fracture in elderly patients [J]. *China Journal of Practical Medicine*, 2017, 44(3): 58-61. (in Chinese)
- [3] Luksameearunothai K, Sa-Ngasongsong P, Kulachote N, et al. Usefulness of clinical predictors for preoperative screening of deep vein thrombosis in hip fractures[J]. *BMC Musculoskelet Disord*, 2017, 18(1): 208.
- [4] Saragas NP, Ferrao PN, Jacobson BF, et al. The benefit of pharmacological venous thromboprophylaxis in foot and ankle surgery[J]. *S Afr Med J*, 2017, 107(4): 327-330.
- [5] Parameswaran A, Krishnamoorthy VP, Oommen AT, et al. Is pre-operative assessment of coagulation profile with Thrombelastography (TEG) useful in predicting venous thromboembolism (VTE) following orthopaedic surgery [J]? *J Clin Orthop Trauma*, 2016, 7(Suppl 2): 225-229.
- [6] 李德剑,陈武,刘昌生,等. 预防高龄髋部骨折患者深静脉血栓 206 例的临床分析[J]. *中国现代药物应用*, 2017, 11(18): 29-30.
Li DJ, Chen W, Liu CS, et al. A clinical analysis of 206 cases of deep venous thrombosis in elderly hip fracture patients [J]. *Chinese Modern Drug Use*, 2017, 11(18): 29-30.
- [7] Lin FF, Lin CH, Chen B, et al. Combination prophylaxis versus pharmacologic prophylaxis alone for preventing deep vein thrombosis in hip surgery[J]. *Hip Int*, 2016, 26(6): 561-566.
- [8] 王虎,付亚辉,尚昆,等. 单一下肢骨折患者住院期间深静脉血栓发生率及分布特点[J]. *骨科临床与研究杂志*, 2017, 2(3): 142-148.
Wang H, Fu YH, Shang K, et al. The incidence and distribution of deep venous thrombosis in patients with single lower extremity fracture. *Journal of Orthopedic Clinical and Research*, 2017, 2(3): 142-148.
- [9] Song K, Yao Y, Rong Z, et al. The preoperative incidence of deep vein thrombosis (DVT) and its correlation with postoperative DVT in patients undergoing elective surgery for

- femoral neck fractures[J]. Arch Orthop Trauma Surg, 2016, 136 (10): 1459-1464.
- [10] Kim KK, Won Y, Won YY. The efficacy of low molecular weight heparin for the prevention of venous thromboembolism after hip fracture surgery in Korean patients[J]. Yonsei Med J, 2016, 57 (5): 1209-1213.
- [11] 雷金来, 丛雨轩, 庄岩, 等. 术前应用氨甲环酸对股骨近端防旋髓内钉固定治疗股骨转子间骨折隐性失血的影响[J]. 中华创伤骨科杂志, 2017, 19(2): 103-108.
- Lei JL, Cong YX, Zhuang Y, et al. Application of tranexamic acid on prevention of proximal femoral fixation for intertrochanteric fracture of the effect of hidden blood loss [J]. Chinese Journal of Orthopaedic Trauma, 2017, 19 (2): 103-108.
- [12] 刘永立, 程富礼, 景小博, 等. 血浆 D-2 聚体预测学龄期儿童下肢骨折后发生深静脉血栓的意义[J]. 中国骨与关节杂志, 2017, 6(7): 526-529.
- Liu YL, Cheng FL, Jing XB, et al. Plasma D-2 dimer prediction of deep venous thrombosis after lower limb fracture of school-age children China significance [J]. Journal of Bone and Joint, 2017, 6 (7): 526-529.
- [13] Hong CC, Nashi N, Makandura MC, et al. Cemented hemiarthroplasty in traumatic displaced femoral neck fractures and deep vein thrombosis: is there really a link[J]? Singapore Med J, 2016, 57(2): 69-72.
- [14] Liu Z, Han N, Xu H, et al. Incidence of venous thromboembolism and hemorrhage related safety studies of preoperative anticoagulation therapy in hip fracture patients undergoing surgical treatment: a case-control study [J]. BMC Musculoskelet Disord, 2016, 12(17): 76.
- [15] 孙军. 微创髓外固定系统和髓内固定系统应用于股骨转子部骨折手术中的临床效果对比分析[J]. 检验医学与临床, 2017, 14(12): 1821-1823.
- Sun J. Comparative analysis of minimally invasive extramedullary fixation system and intramedullary fixation system applied in operation of femoral trochanteric fracture. [J]. Laboratory Medicine and Clinic, 2017, 14 (12): 1821-1823.
- [16] Haque S, Davies MB. Oral thromboprophylaxis in patients with ankle fractures immobilized in a below the knee cast[J]. Foot Ankle Surg, 2015, 21(4): 266-268.
- [17] Liu M, Liu L, Huang F, et al. Perioperative treatment of femoral neck fracture with deep venous thrombosis: A case report[J]. Chin J Traumatol, 2015, 18(2): 109-112.
- [18] Cho YH, Byun YS, Jeong DG, et al. Preoperative Incidence of Deep Vein Thrombosis after Hip Fractures in Korean[J]. Clin Orthop Surg, 2015, 7(3): 298-302.
- [19] Murphy RF, Naqvi M, Miller PE, et al. Pediatric orthopaedic lower extremity trauma and venous thromboembolism[J]. J Child Orthop, 2015, 9(5): 381-384.
- [20] 黄纯聪, 张华义, 杨德兵, 等. 髋部骨折牵引床术后下肢深静脉血栓形成的危险性观察[J]. 现代医药卫生, 2017, 33(10): 1524-1525.
- Huang CC, Zhang HY, Yang DB, et al. Observation of the risk of deep vein thrombosis after hip fracture traction operation. [J]. Modern Medicine and Health, 2017, 33 (10): 1524-1525.
- [21] Sathiyakumar V, Greenberg SE, Jahangir AA, et al. Impact of type of surgery on deep venous thrombi and pulmonary emboli: a look at twenty seven thousand hip fracture patients [J]. Int Orthop, 2015, 39(10): 2017-2022.
- [22] Werner BC, Fashandi AH, Gwathmey FW, et al. Trends in the management of intertrochanteric femur fractures in the United States 2005-2011[J]. Hip Int, 2015, 25(3): 270-276.
- [23] 葛波涌, 王玉波, 丁丽, 等. 股骨干骨折并发下肢深静脉血栓形成的危险因素研究[J]. 中华实验外科杂志, 2016, 33(3): 817-819.
- Ge BY, Wang YB, Ding L, et al. Risk factors for femoral shaft fracture complicated with deep venous thrombosis of lower extremities [J]. Chinese Journal of Experimental Surgery, 2016, 33 (3): 817-819.
- [24] Protty MB, Aithal S, Hickey B, et al. Mechanical prophylaxis after hip fracture: what is the risk of deep vein thrombosis? A retrospective observational study [J]. BMJ Open, 2015, 5 (2): e006956.
- [25] Wang Q, Yang X, He HZ, et al. Comparative study of InterTAN and Dynamic Hip Screw in treatment of femoral intertrochanteric injury and wound [J]. Int J Clin Exp Med, 2014, 7 (12): 5578-5582.
- [26] 蔡丽萍, 傅红飞, 汤海燕, 等. 低分子肝素钙结合早期康复干预预防股骨粗隆间骨折内固定术后深静脉血栓的效果[J]. 中国生化药物杂志, 2017, 37(2): 216-219.
- Cai LP, Fu HF, Tang HY, et al. Low molecular heparin calcium combined with early rehabilitation intervention to prevent deep vein thrombosis after internal fixation of femoral intertrochanteric fracture [J]. Chinese Journal of Biochemical Medicine, 2017, 37 (2): 216-219.
- [27] Wong KL, Daruwalla ZJ, Lan CJ, et al. Postoperative venous thrombotic events in Asian elderly patients with surgically treated hip fractures with and without chemoprophylaxis [J]. Hip Int, 2014, 24(6): 650-655.

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