doi:10.11659/jjssx.07E019146

·临床报道·

关节镜下半月板成形术后早期感染的诊断和治疗

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[摘 要] **目的** 探讨半月板损伤术后膝关节早期感染的诊治要点及临床预后,分析预防措施。**方法** 回顾性分析2015年1月至2018年1月在我院行关节镜微创治疗的225例半月板损伤患者的临床资料,对其中高度怀疑术后发生关节内感染的患者进行诊治。比较治疗前后的血白细胞计数(WBC)、中性粒细胞百分比(NEUT%)、血沉(ESR)及C-反应蛋白(CRP)水平,采用Lysholm评分对膝关节功能进行评价。**结果** 本组患者有4例术后发生膝关节内感染,感染发生率1.7%,其中3例为表皮样葡萄球菌感染,1例为金黄色葡萄球菌感染。经治疗后,膝关节感染症状及体征均消失,感染治愈,膝关节活动无明显受限;WBC、NEUT%、ESR及CRP较治疗前明显下降,并恢复至正常。术后8周Lysholm评分与治疗前相比,差异具有统计学意义($P<0.05$)。**结论** 半月板损伤术后关节内感染发生率较低,但得到的重视程度不够,早期介入可获得良好预后;症状缓解后应早期康复锻炼,避免关节僵硬发生。

[关键词] 关节镜;半月板;术后感染;膝关节感染;半月板修复术;置管引流

[中图分类号] R687.4+2;R619+.3 [文献标识码] A [收稿日期] 2019-07-18

Diagnosis and treatment of early infection after arthroscopic meniscal repair

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Abstract: Objective To investigate the diagnosis and therapeutic strategy on early knee infection after arthroscopic meniscal surgery, and to observe the clinical prognosis of patients. **Methods** The medical records of 225 patients who underwent meniscal plasty in our hospital from January 2015 to January 2018 were retrospectively analyzed. The patients with high suspicion of postoperative intra-articular knee infection were diagnosed and treated. The white blood cell (WBC) counts, neutrophil percentage (NEUT%), erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP) levels of the patients were observed and compared before and after the treatment. Lysholm score was used to evaluate the knee joint activity before and after treatment. **Results** Among 225 patients, 4 cases developed intra-articular knee injection after surgery, and the incidence rate was 1.7%, including 3 cases of staphylococcus epidermidis, 1 case of staphylococcus aureus. After the treatment, the symptoms of the knee joint infection disappeared, the infection was cured, and the knee joint movement was not obviously limited. The WBC, NEUT%, ERS and CRP levels were significantly reduced after the treatment compared with those before treatment, and then returned to normal. There was statistically significant difference in Lysholm score of knee joint between before and 8 weeks after operation ($P<0.05$). **Conclusion** The incidence of intra-articular knee infection after meniscal surgery is low, which needs more attention. Early intervention can achieve good prognosis. After the symptoms relieved, early rehabilitation exercises should be taken to avoid the occurrence of joint stiffness.

Keywords: athroscopy; meniscus; postoperative infection; knee infection; meniscal repair; percutaneous catheter drainage

关节镜下手术治疗半月板损伤已成为目前主流的治疗方法,相比传统开放术式,其具有视野清晰、微创、术后恢复快等优势。虽然关节镜手术并发症远低于开放手术,但仍不能完全避免术后感染[1-2]。随着关节镜技术日益发展,开展关节镜手术的地区医疗机构增加,术后感染发生率也相应上升。术后感染如未得到及时诊治,可导致关节软骨破坏、关节纤维性粘连等不良后果,需引起广大临床骨科医生的重视。目前对于关节镜下半月板手术后感染的诊治流程尚无统一标准。本研究通过回顾性分析我院2015年1月至2018年1月收治的225例半月板损伤行关节镜手术患者的临床资料,对术后膝关节感染的病因、临床表现、防治措施及预后进行分析总结,以期为临床早期诊断和及时有效地治疗术后感染提供参考。

1 资料与方法

1.1 临床资料

本组膝关节半月板损伤患者共225例,均为单纯

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修整成形术(无内植物置入)。患者无其他系统疾病,体温升高(38.5°以上),部分患者伴有畏寒,术后持续存在术区疼痛,并出现加重趋势,局部主要表现为红肿、皮温高、弥漫性压痛并凹陷性水肿、术区切口持续渗液,则怀疑术后感染。

1.2 治疗方法

对于高度怀疑术后膝关节感染的患者,当即行关节腔穿刺抽液及切口分泌物送检,标本一式两份。尽早使用广谱抗生素(后期依据药敏结果及时调整),告知患者病情并做好医患沟通,同时积极完善术前准备。神经阻滞麻醉后行关节镜下探查清理并置管冲洗引流,术后关节腔持续冲洗(等渗冲洗液 3 000 mL 配伍庆大霉素 160 000 u)。待关节肿胀疼痛缓解或消失,血常规、ESR 和 CRP 均恢复正常,引流液连续 3 次细菌培养呈阴性后可停止冲洗,继续保持引流管,72 h 后拔除。血常规、CRP 和 ESR 恢复正常后停止静脉注射抗生素,改口服抗生素继续抗感染治疗 1 周。

1.3 康复训练

术后支具伸直位临时制动,早期行冰敷和气压治疗,在此基础上鼓励患者行患肢股四头肌收缩训练及踝泵练习,症状消失后即开始被动伸、屈膝关节,根据病情可酌情主动伸、屈膝及肌力训练。

1.4 观察指标

比较治疗前后的 WBC、NEUT% 、ESR、CRP 水平,术后 8 周依据 Lysholm 评分对膝关节功能进行评价。

1.5 统计学分析

采用 SPSS 17.0 软件进行统计分析,计量资料以均数 ± 标准差($\bar{x} \pm s$)表示,采用 t 检验, $P<0.05$ 为差异有统计学意义。

2 结果

本组 225 例半月板损伤患者中,有 4 例术后发生膝关节内感染,感染发生率 1.7%。分泌物细菌培养结果显示,3 例为表皮样葡萄球菌,1 例为金黄色葡萄球菌。经治疗后,膝关节感染症状及体征均消失,感染治愈,膝关节活动无明显受限;WBC、NEUT% 、ESR 及 CRP 水平较治疗前明显下降,差异有统计学意义($P<0.05$);术后 8 周Lysholm 评分与治疗前相比,差异具有统计学意义($P<0.05$),见表 1。

表 1 感染患者治疗前后相关指标比较($\bar{x} \pm s$, $n=4$)

时间	WBC ($\times10^9$/L)	NEUT%	ESR (mm/h)	CRP (mg/L)	Lysholm 评分 (分)
治疗前	13.1 ± 3.9	0.8 ± 0.1	77.5 ± 35.8	110.0 ± 45.4	43.5 ± 8.3
治疗后	7.5 ± 2.2	0.6 ± 0.1	16.8 ± 6.6	6.3 ± 3.8	89.8 ± 4.6
P	0.04	0.01	0.02	0.00	0.00

3 讨论

对于关节镜术后感染目前尚未统一诊断标准[3]。本研究术后膝关节内感染率为 1.7%,与既往国内外文献报道相当[4-7]。研究显示,关节镜术后膝关节感染的发生与患者基础疾病、年龄、免疫力低下等因素相关[8-9]。此外还可能与术中的无菌操作、手术时间增加、止血带使用、中转切开手术操作等因素有关。早期感染最常见影响因素包括手术时间及术后引流[10]。半月板单纯修复手术技术成熟且手术时间短,故暂不考虑手术时间因素,而本组 4 例患者术后早期均出现膝关节肿胀,关节腔内积血形成血肿,影响患者术后功能的同时,也是细菌生长的良好培养基,易诱发感染[11]。单纯关节镜半月板手术后的明显疼痛一般不超过 2 d。如患者术后没有逐渐恢复,而是出现疼痛突然加重、间断发烧、局部红肿、持续渗液、活动度丧失、全身不适等情况,则应该考虑为化脓性关节炎[12-13]。预防术后感染应注意:①术前全面彻底检查,明确其他非手术部位(呼吸道、泌尿系统、消化系统、皮肤软组织等)是否存在潜在感染,如存在感染应及时控制,复查正常后再进行手术;②术前对所需器械进行严格消毒,在层流手术间开展手术;③严格无菌操作;④术后引流管规范放置(本院引流管拔除标准:引流量少于50 mL,时间不超过 48 h,以避免逆行感染)[14];⑤预防性使用抗菌药物;⑥针对感染不可避免的情况,早期应用足量广谱抗生素(推荐第三代头孢菌素),并在后续治疗过程中根据实验室细菌培养药敏结果及时调整[15-16]。

术后膝关节感染的处理原则是早预判和早诊治[17]。本研究利用 WBC、NEUT% 、ESR、CRP 等常规诊断指标,对感染及预后进行判断[18-20]。关节镜清理及置管冲洗引流是治疗膝关节感染最为有效的方式[21]。本组 4 例感染患者均表现出不同程度 WBC、NEUT% 、ESR、CRP 指标上升,在关节镜清理及置管冲洗引流治疗后,相关指标明显下降并恢复至正常范围,膝关节感染症状及体征均消失,感染治愈,膝关节活动无明显受限。可见,早期预判、诊断并进行积极合理的治疗可以最大程度地减少膝关节感染造成的不良后果。满意的患肢功能是理想疗效的重要组成部分,不可或缺,本研究认为在症状控制后(静止时无红肿热痛表现)即开始功能锻炼(被动为主),同时做好患者心理辅导,防止关节粘连发生,患者可获得满意的患肢功能。

综上所述,关节镜半月板损伤的微创治疗遵循术前把控风险评估、术中精细无菌操作、术后有效预防的原则,可有效降低感染发生率,一旦出现需早预判及诊疗,以促进关节功能恢复。

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(编辑:杨 颖)