

· 综述 ·

《骶尾部藏毛疾病诊治中国专家共识（2023版）》要点解读

曹永丽¹, 杨维维¹, 魏东^{2△}

1 中国人民解放军联勤保障部队第九八九医院普通外科 河南洛阳 471031

2 郑州大学附属洛阳中心医院胃结直肠肛门外科 河南洛阳 471031

△通信作者, E-mail: wd150yyw5k@yeah.net

[摘要] 骶尾部藏毛疾病是一种与臀沟毛发密切相关的获得性疾病，其发病率为26/100 000，呈逐年上升趋势。由于骶尾部藏毛疾病的发病机制尚存在争议，治疗方法和治疗效果评价标准不规范、不统一。为了进一步推动我国骶尾部藏毛疾病的规范化诊疗，由中国医师协会肛肠医师分会牵头组织国内相关领域专家，借鉴国际相关指南和文献，结合我国的研究成果及临床实践，经过反复讨论，对有争议的问题进行投票，最终形成了《骶尾部藏毛疾病诊治中国专家共识（2023版）》。该共识属于国内首次提出的关于骶尾部藏毛疾病诊治工作规范的临床指导意见，它的发布将有助于提高我国临床医师对骶尾部藏毛疾病的认识和治疗水平，规范和优化治疗方案，推动相关领域的学术交流和临床研究发展，最终造福于患者。本文对其中重点内容进行解读，与同道交流。

[关键词] 骶尾部藏毛疾病；诊断和治疗；中国专家共识

Key points interpretation of the Chinese expert consensus on the diagnosis and treatment of sacrococcygeal pilonidal disease (2023 edition)

Cao Yongli¹, Yang Weiwei¹, Wei Dong^{2△}

1 Department of General Surgery, The 989th Hospital of Joint Logistics Support Force of Chinese People's Liberation Army, Luoyang 471031, Henan, China;

2 Department of Gastrointestinal and Anorectal Surgery, Luoyang Central Hospital Affiliated to Zhengzhou University, Luoyang 471031, Henan, China

[Abstract] Sacrococcygeal pilonidal disease is an acquired condition closely associated with hair in the gluteal sulcus. The incidence of sacrococcygeal pilonidal disease is 26 per 100,000, and it has been increasing annually. Due to ongoing controversies regarding the pathogenesis of sacrococcygeal pilonidal disease, there is a lack of standardization and uniformity in treatment methods and evaluation criteria for treatment effectiveness. To further advance the standardized diagnosis and treatment of sacrococcygeal pilonidal disease in China, the Anorectal Branch of Chinese Medical Doctor Association initiated and organized domestic experts in related fields. By referencing relevant international guidelines and literature, and combining China's research findings and clinical practice, after repeated discussions and voting on controversial issues, the *Chinese expert consensus on the diagnosis and treatment of sacrococcygeal pilonidal disease (2023 edition)* was finally formulated. This consensus represents the first clinical guidance on the diagnosis and treatment of sacrococcygeal pilonidal disease in China. Its publication aims to enhance the understanding and treatment capabilities of Chinese clinicians regarding sacrococcygeal pilonidal disease, standardize and optimize treatment plans, promote academic exchanges and clinical research development in related fields, and ultimately benefit patients. This article interprets the key contents of the consensus and communicates with colleagues.

[Keywords] sacrococcygeal pilonidal disease, diagnosis and treatment, chinese expert consensus

骶尾部藏毛疾病（sacrococcygeal pilonidal disease, SPD）是一种与臀沟毛发密切相关的获得性疾病^[1]。SPD好发于20~40岁的青年男性，发病率为26/100 000^[2]。由于国内没有规范统一的SPD诊治指导意见，致使该病在规范化诊疗方面仍无统一标准，诊

断准确性低，误诊和漏诊率高。《骶尾部藏毛疾病诊治中国专家共识（2023版）》（下文统称共识）^[3]，属于国内首次提出的关于SPD诊治工作规范的临床指导意见，它的发布将有助于提高国内临床医师对SPD的治疗水平，规范治疗方案，推动相关领域的学术交流

和临床研究发展,最终造福于患者。本文对其中重点内容进行解读,与同道交流。

该共识根据GRADE系统进行证据质量评估及推

荐强度分级,将证据推荐强度分为高、中、低、极低四个等级;同时将推荐强度分为强推荐、弱推荐,见表1^[4]。

表1 推荐分级的评估、制定与评价(GRADE)证据质量描述^[4]
Tab.1 Grading of Recommendations Assessment, Development and Evaluation (GRADE)^[4]

分级	具体描述
证据强度分级	
高(A)	非常有把握观察值效应值接近真实值效应值
中(B)	对观察值效应值有中等把握:观察值效应值有可能接近真实值效应值,但也有可能差别较大
低(C)	对观察值效应值的把握有限:观察值效应值可能与真实值有很大差别
极低(D)	对观察值效应值几乎没有把握:观察值效应值与真实值效应值可能有极大差别
推荐强度分级	
强推荐	明确显示干预措施利大于弊或者弊大于利
弱推荐	利弊不确定,或无论质量高低的证据均显示利弊相当

1 诊断评估

1.1 SPD的临床表现

SPD包括急性感染和慢性窦道形成这两个阶段;初期臀沟皮肤毛囊阻塞,继之毛囊扩张,感染,形成脓肿并破溃,临床表现为骶尾部的肿胀或剧烈疼痛等;继之形成慢性窦道,可反复发作,最终形成一个或多个窦口与小凹相通即形成骶尾部慢性窦道^[5-7]。

1.2 诊断和鉴别诊断

多数情况下通过病史和体格检查可明确SPD诊断。对靠近肛缘的窦道需与肛周感染性疾病、肛瘘、鳞状细胞癌等相鉴别。SPD特征性表现为窦道位于臀沟近中线处,走行指向头侧,且内藏毛发。如窦道向尾侧延伸靠近肛门,易与肛周疾病混淆,此时,详尽的肛门直肠检查、直肠镜、超声或骶尾部MRI检查均有助于鉴别诊断^[8-9]。MRI由于对软组织分辨率高,无放射性,可以显示藏毛窦的范围、深度、邻近组织结构,有助于临床鉴别诊断和手术方案的制订^[8]。如果外观发现可疑皮损,应行活组织病理检查。

鉴于诊断评估在SPD诊治中的重要性,该共识推荐根据病史、临床表现和体格检查进行临床诊断;同时强调鉴别诊断的重要性,指出如果SPD的窦道靠近肛缘,应进行肛门直肠检查和常规MRI影像学检查,以与其他肛肠疾病相鉴别。(证据质量: A, 推荐强度: 强推荐)。

1.3 SPD的危险因素

SPD的危险因素较多,久坐、局部多毛和卫生不

良是其中三个常见危险因素,72%的SPD患者都有这三个危险因素。同时存在毛发脱落形成入侵、毛发侵入的动力、局部皮肤易损伤性这三个因素才可能发展成藏毛疾病^[10-13]。而有家族史和肥胖(身体质量指数 $> 25 \text{ kg/m}^2$)的人群更易发生本病,且与术后复发率增加有关^[14],该共识提出通过对这些危险因素的认识,可以针对性指导患者改变不良生活方式,减少疾病的复发。(证据质量: B, 推荐强度: 强推荐)。

2 治疗策略

SPD的治疗方法可分为非手术治疗、手术治疗和微创技术。尽管窦道特征和疾病的复杂程度可能影响手术决策和患者预后,但目前尚缺乏统一的SPD分类标准以指导治疗方案的选择^[15-16]。治疗方案应根据患者病情进行个体化选择^[17]。

2.1 非手术治疗

如果SPD患者没有任何不适症状,不需要手术治疗^[18-19]。此类患者采用定期复查和随访,并针对相关的危险因素予以干预,可减少或避免患者出现SPD的症状^[20]。该共识不建议对无明显症状的SPD患者进行手术治疗。(证据质量: A, 推荐强度: 强推荐)。SPD患者的症状不会自愈,需行相应治疗。

2.1.1 臀沟及周围皮肤脱毛 臀沟及周围皮肤脱毛是针对SPD危险因素而制定的预防和治疗措施。由于SPD是一种与臀沟毛发密切相关的后天获得性疾病,定期臀沟剃毛或采用其他脱毛方法去除臀沟及周围皮肤的毛发是SPD的非手术治疗方法,其不但对SPD有

治疗作用，而且还可以减少SPD的复发^[21-22]。常用脱毛方法有剃刀脱毛、激光脱毛、脱毛膏脱毛等。剃毛的频率建议至少每2周1次。激光脱毛的费用较高，间隔时间长，但复发率低于其他方法^[6,23-24]。尽管在术后用剃刀脱毛的时机和时间方面仍存在一些争议^[2,25]，但是臀沟及周围皮肤脱毛治疗方法风险相对较低，并发症少，可作为辅助治疗重复应用，也可作为慢性SPD的预后措施，避免复发和脓肿形成。该共识推荐采用剃毛或激光脱毛去除臀沟及周围皮肤的毛发，可减少SPD复发。（证据质量：C，推荐强度：强推荐）。

2.1.2 石碳酸和纤维蛋白胶的应用 可在中线小凹内注射石碳酸或纤维蛋白胶治疗SPD。文献报道，石碳酸治疗成功率率为30%~92%^[26-27]；纤维蛋白胶治疗成功率率为90%~100%^[28]。两者的优点为创伤小、疼痛轻、恢复快^[29-30]。石碳酸副作用大，在我国尚无应用病例。纤维蛋白胶治疗SPD尽管疗效较好，但临床应用例数少，还有待于更多研究支持^[31]。该共识指出石碳酸治疗SPD存在争议；纤维蛋白胶可作为辅助治疗方法。（证据质量：C，推荐强度：弱推荐）。

2.1.3 抗生素的应用 抗生素在SPD的治疗中主要用于围手术期的预防、术后治疗和局部使用。抗生素的临床使用时机、时间、方法和应用价值尚不统一^[32-33]。对于切开引流术和病灶切除创面开放二期愈合手术后可局部应用抗生素，对于创面较大的皮瓣技术可视病情预防性静脉应用抗生素，但是对合并严重蜂窝组织炎、使用免疫抑制剂或伴全身性疾病患者应静脉使用抗生素治疗^[7,20]。该共识指出静脉使用抗生素的价值尚缺乏证据，可以视病情选择使用。（证据质量：C，推荐强度：弱推荐）。

2.2 手术治疗

2.2.1 切开引流术 切开引流术是SPD最常用的治疗方法，对急、慢性感染均有效，通常选择在偏中线处切开（切口应足够大），充分搔刮，清除脓腔内的炎性肉芽组织和毛发^[2,34-35]。首次发作的急性SPD行单纯切开引流术后治愈率为60%。提高治愈率的要点是充分切开，彻底清除坏死肉芽组织和毛发；通常不考虑一期缝合，其复发率达15%~40%^[36]。因会延长住院及切口愈合时间，增加复发率，亦不推荐在急性脓肿期采用病灶清除术^[7,37]。该共识推荐急性脓肿期SPD不论是初发还是复发，均需及时切开引流。（证据质量：A，推荐强度：强推荐）。

2.2.2 病灶切除创面开放二期愈合 病灶切除后创面的处理包括创面开放二期愈合、袋形缝合术和一期缝合。病灶切除创面开放二期愈合处理方式具有操作

简单易学、治愈率高、复发率低、易于推广等优点，是治疗SPD的有效方法^[38]。开放创面二期愈合的术后并发症发生率明显低于皮瓣转移术（12% vs. 49%）^[39]，其缺点是切口愈合时间明显延长^[40]。袋形缝合术是介于切口完全开放和完全闭合之间的折中手段，可以减小窦道切除后的创面，缩短愈合时间，其复发率为0~10%^[41-42]。对于一期缝合的患者，偏中线缝合并发症和复发率低，愈合时间短，偏中线缝合的切口感染发生率也低于中线缝合，因此偏中线缝合技术是SPD患者的首选方式^[43-44]。该共识推荐对于慢性SPD患者可行病灶切除，创面开放二期愈合，或切除后作袋形缝合；也可选择病灶切除后一期闭合偏中线缝合。（证据质量：A，推荐强度：强推荐）。

2.2.3 皮瓣技术 皮瓣技术是针对SPD切除后皮肤张力大造成切口感染、开裂、延期愈合等风险而产生的。对于慢性复发性或复发范围广的SPD患者，在切除病灶的同时可采用皮瓣技术，即用健康的组织覆盖切除后的组织缺损，使臀沟提高，降低复发率；常用的皮瓣技术有Limberg皮瓣术及其改良术、Karydakis皮瓣术、Bascom臀沟抬高技术等^[13,45-46]。Limberg皮瓣术最早应用于临床，其他皮瓣技术都是在Limberg皮瓣术基础上进行的演化改良。此类手术成功的关键在于合理设计皮瓣，减少皮瓣张力，保障皮瓣血供，严格无菌操作。各种皮瓣均有不同的优缺点，目前没有哪一种皮瓣技术优于另一种皮瓣技术，亦不能寄希望于某种手术方式治愈所有患者，医师需根据自己的专业知识，采用擅长技术，结合患者的具体情况个体化的应用，使患者受益最大化。该共识推荐对于慢性复发性或复发范围广的SPD患者，在切除病灶的同时可采用皮瓣技术。（证据质量：A，推荐强度：强推荐）。

2.3 微创技术

2.3.1 小凹摘除术（也称“简单Bascom手术”） SPD最理想的手术方式应具有风险小、创伤小、并发症少、复发率低、恢复快、费用低等特点^[47]。小凹摘除术是最符合这一理念的手术。该手术于1980年由Bascom首先报道，术中只切除扩张毛囊的原发口，在侧方切口引流达到治愈SPD的目的。研究结果显示，采用小凹摘除术治疗SPD，术后3年随访，并无严重并发症，治愈率达84%^[48-49]。采用小凹摘除术治疗SPD急性期大范围感染的患者，治愈率达100%^[47]。因此该共识推荐小凹摘除术可用于轻度至中度急性或慢性SPD患者。（证据质量：B，推荐强度：强推荐）。

2.3.2 激光消融闭合术（sinus laser closure, SiLaC）

和视频辅助下 SPD 切除 SiLaC 不需要将窦道连同周围健康组织一并切除，而是通过使用激光探针永久性破坏窦道的上皮组织，同时将整个腔隙闭合达到治疗目的^[50]。SiLaC 创伤小、痛苦少、恢复快、并发症少，成功率为 86%~94%^[51-55]。该术式的局限性在于无法直视下操作，可能存在遗漏分支窦道未处理、对窦道内上皮组织和肉芽组织烧灼不完全以及毛发清理不彻底的情况，因此适合感染范围小而局限的患者；不适合用于有过局部切开或缝合的患者；亦不适合急性期、感染腔隙过大和分支窦道较多的患者^[51]。该方法远期疗效尚需更多研究观察确定。

2014 年 Milone 等^[56]提出了一种新型的微创手术，即视频辅助下 SPD 切除。该手术在视频辅助下清除窦道内所有的毛发和碎屑，对周围组织损伤小，疼痛轻，能够使患者快速恢复正常工作生活^[57]。由于该手术需要专门的技术和技能，目前还缺乏大样本的临床研究证据。该共识推荐可以使用激光消融、视频辅助等微创技术治疗 SPD，但需要专门的设备和专业技能。（证据质量：C，推荐强度：弱推荐）。

3 伤口管理

加强 SPD 患者手术后创面管理有助于创面修复，减少甚至避免并发症发生。对于开放性伤口，手术后使用促进伤口愈合的药物，局部使用抗生素避免伤口

感染；如果创面有渗血可局部或全身应用止血药。一期缝合伤口，手术后放置引流管，有利于引流清除渗出液和冲洗创面，避免伤口裂开，缩短愈合时间^[58-59]。该共识推荐对于一期缝合的 SPD 患者，可根据具体情况酌情使引流装置，结合真空辅助闭合负压引流装置可加快创面愈合，减少伤口感染、裂开和积液等术后并发症的发生。（证据质量：A，推荐强度：强推荐）。

4 小结

SPD 的发病部位特殊，反复发作，且该病的发病率呈上升趋势，影响患者的生活质量，也引起了医学界的关注。该共识为临床医师提供较为全面的诊断评估思路和治疗指导意见（诊疗流程图见图 1），为 SPD 诊断和规范化治疗提供了方法参考。同时，该共识也指出了目前临床 SPD 诊疗存在的一些争议及有待解决的问题，如 SPD 术后剃刀脱毛的时机和时间、抗生素的临床使用方法及皮瓣技术的应用，医师应根据自己的专业知识和技术能力，结合患者的具体情况个体化缝合技术，使患者受益最大化。我们期待临床医师在该共识的基础上推陈出新，完成更多高质量的研究，找到疗效更好、复发率更低、并发症更少的 SPD 治疗新方法，为临床医师提供更有价值的指导意见，规范化我国 SPD 诊治方法和提升应用效果。

利益冲突声明 全体作者均声明不存在与本文相关的利益冲突。

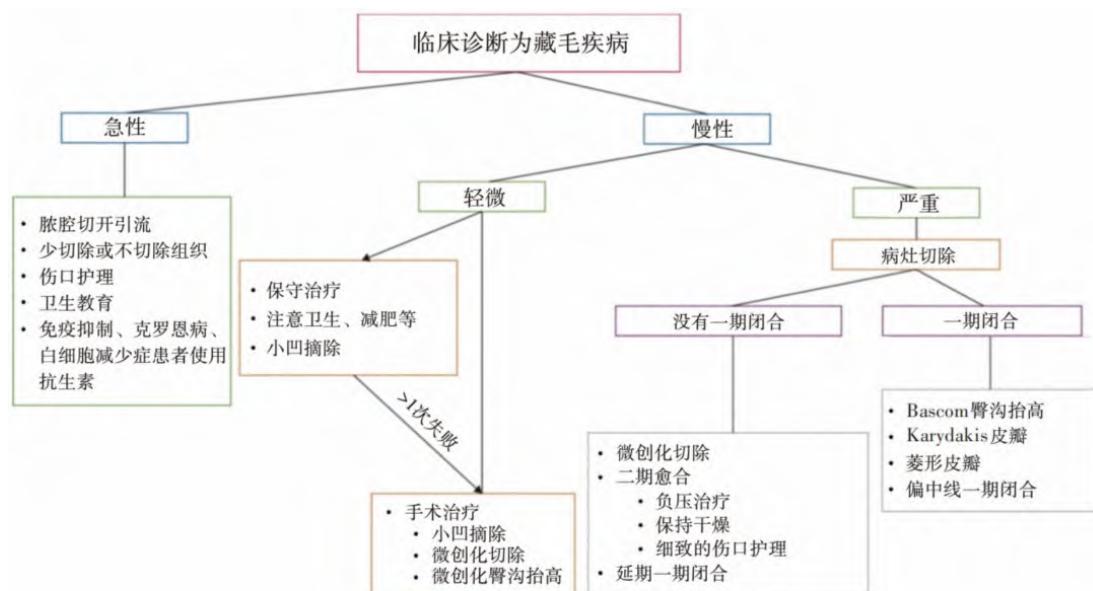


图 1 SPD 诊疗流程图^[3]

Fig.1 Flowchart of diagnosis and treatment of sacrococcygeal pilonidal disease^[3]

参考文献

[1] DA SILVA J H. Pilonidal cyst: cause and treatment[J]. Dis-

eases of the colon and rectum, 2000, 43(8): 1146-1156.

- [2] MILONE M, BASSO L, MANIGRASSO M, et al. Consensus statement of the Italian society of colorectal surgery (SICCR): management and treatment of pilonidal disease[J]. Techniques in coloproctology, 2021, 25(12): 1269-1280.
- [3] 中国医师协会肛肠医师分会, 中国医师协会肛肠医师分会临床指南工作委员会, 中国医疗保健国际交流促进会结直肠病学分会. 髑尾部藏毛疾病诊治中国专家共识(2023版)[J]. 中华胃肠外科杂志, 2023, 26(11): 1008-1016.
- [4] BALSHEM H, HELFAND M, SCHÜNEMANN H J, et al. GRADE guidelines: 3. Rating the quality of evidence[J]. Journal of clinical epidemiology, 2011, 64(4): 401-406.
- [5] HULL T L, WU J. Pilonidal disease[J]. The surgical clinics of North America, 2002, 82(6): 1169-1185.
- [6] KHANNA A, ROMBEAU J L. Pilonidal disease[J]. Clinics in colon and rectal surgery, 2011, 24(1): 46-53.
- [7] JOHNSON E K, VOGEL J D, COWAN M L, et al. The American Society of Colon and Rectal Surgeons' clinical practice guidelines for the management of pilonidal disease[J]. Diseases of the colon and rectum, 2019, 62(2): 146-157.
- [8] 李刚, 王青云, 覃达贤, 等. 藏毛窦的CT及MRI诊断[J]. 中国临床医学影像杂志, 2013, 24(11): 825-826.
- [9] YOUSSEF A T. The value of superficial parts and endoanal ultrasonography in evaluating pilonidal disease and exclusion of perianal sepsis[J]. Journal of ultrasound, 2015, 18(3): 237-243.
- [10] BOLANDPARVAZ S, MOGHADAM D P, SALAHI R, et al. Evaluation of the risk factors of pilonidal sinus: a single center experience[J]. The Turkish journal of gastroenterology: the official journal of Turkish Society of Gastroenterology, 2012, 23(5): 535-537.
- [11] HARLAK A, MENTES O, KILIC S, et al. Sacrococcygeal pilonidal disease: analysis of previously proposed risk factors[J]. Clinics (São Paulo, Brazil), 2010, 65(2): 125-131.
- [12] KARYDAKIS G E. New approach to the problem of pilonidal sinus[J]. Lancet, 1973, 2(7843): 1414-1415.
- [13] KARYDAKIS G E. Easy and successful treatment of pilonidal sinus after explanation of its causative process[J]. The Australian and New Zealand journal of surgery, 1992, 62(5): 385-389.
- [14] DOLL D, MATEVOSSIAN E, WIETELMANN K, et al. Family history of pilonidal sinus predisposes to earlier onset of disease and a 50% long-term recurrence rate[J]. Diseases of the colon and rectum, 2009, 52(9): 1610-1615.
- [15] TEZEL E. A new classification according to navicular area concept for sacrococcygeal pilonidal disease[J]. Colorectal disease: the official journal of the Association of Coloproctology of Great Britain and Ireland, 2007, 9(6): 575-576.
- [16] GUNER A, CEKIC A B, BOZ A, et al. A proposed staging system for chronic symptomatic pilonidal sinus disease and results in patients treated with stage-based approach[J]. BMC Surgery, 2016, 16: 18.
- [17] BEAL E M, LEE M J, HIND D, et al. A systematic review of classification systems for pilonidal sinus[J]. Techniques in coloproctology, 2019, 23(5): 435-443.
- [18] DOLL D, FRIEDERICHS J, BOULESTEIX A L, et al. Surgery for asymptomatic pilonidal sinus disease[J]. International journal of colorectal disease, 2008, 23(9): 839-844.
- [19] IESALNIEKS I, OMMER A, HEROLD A, et al. German National Guideline on the management of pilonidal disease: update 2020[J]. Langenbeck's archives of surgery, 2021, 406(8): 2569-2580.
- [20] STEELE S R, HULL T L, READ T E, et al. The ASCRS textbook of colon and rectal surgery[M]. 3rd ed. New York, NY: Springer, 2016.
- [21] KELATI A, LAGRANGE S, LE DUFF F, et al. Laser hair removal after surgery vs. surgery alone for the treatment of pilonidal cysts: a retrospective case-control study[J]. Journal of the European Academy of Dermatology and Venereology: JEADV, 2018, 32(11): 2031-2033.
- [22] KARGIN S, DOĞRU O, TURAN E. Is hair removal necessary after crystallized phenol treatment in pilonidal disease?[J]. Medical principles and practice: international journal of the Kuwait University, Health Science Centre, 2021, 30(5): 455-461.
- [23] PRONK A A, EPPINK L, SMAKMAN N, et al. The effect of hair removal after surgery for sacrococcygeal pilonidal sinus disease: a systematic review of the literature[J]. Techniques in coloproctology, 2018, 22(1): 7-14.
- [24] LUKISH J R, KINDELAN T, MARMON L M, et al. Laser epilation is safe and effective therapy for teenagers with pilonidal disease[J]. Journal of pediatric surgery, 2009, 44(1): 282-285.
- [25] PETERSEN S, WIETELMANN K, EVERST T, et al. Long-term effects of postoperative razor epilation in pilonidal sinus disease[J]. Diseases of the colon and rectum, 2009, 52(1): 131-134.
- [26] DOĞRU O, CAMCI C, AYGEN E, et al. Pilonidal sinus treated with crystallized phenol: an eight-year experience[J]. Diseases of the colon and rectum, 2004, 47(11): 1934-1938.
- [27] AYGEN E, ARSLAN K, DOĞRU O, et al. Crystallized phenol in nonoperative treatment of previously operated, recurrent pilonidal disease[J]. Diseases of the colon and rectum, 2010, 53(6): 932-935.
- [28] CALIKOGLU I, GULPINAR K, OZTUNA D, et al. Phenol injection versus excision with open healing in pilonidal disease: a prospective randomized trial[J]. Diseases of the colon and rectum, 2017, 60(2): 161-169.
- [29] ELSEY E, LUND J N. Fibrin glue in the treatment for pilonidal sinus: high patient satisfaction and rapid return to normal activities[J]. Techniques in coloproctology, 2013, 17(1): 101-104.
- [30] ALTINLI E, KOKSAL N, ONUR E, et al. Impact of fibrin sealant on Limberg ap technique: results of a randomized controlled trial[J]. Techniques in coloproctology, 2007, 11(1): 22-25.
- [31] LUND J, TOU S, DOLEMAN B, et al. Fibrin glue for pilonidal sinus disease[J]. The Cochrane database of systematic reviews, 2017, 1(1): CD011923.
- [32] CHAUDHURI A, BEKDASH B A, TAYLOR A L. Single-dose metronidazole vs 5-day multi-drug antibiotic regimen in excision of pilonidal sinuses with primary closure: a prospective, randomized, double-blinded pilot study[J]. International journal of colorectal disease, 2006, 21(7): 688-692.
- [33] KUNDES M F, CETIN K, KEMENT M, et al. Does prophylactic antibiotic reduce surgical site infections after rhomboid excision and Limberg flap for pilonidal disease: a prospective randomized double blind study[J]. International journal of colorectal disease, 2016, 31(5): 1089-1091.

- [34] VAHEDIAN J, NABAVIZADEH F, NAKHAEI N, et al. Comparison between drainage and curettage in the treatment of acute pilonidal abscess[J]. Saudi medical journal, 2005, 26(4): 553-555.
- [35] GARG P, MENON G R, GUPTA V. Laying open (deroofing) and curettage of sinus as treatment of pilonidal disease: a systematic review and meta-analysis[J]. ANZ journal of surgery, 2016, 86(1/2): 27-33.
- [36] FITZPATRICK E B, CHESLEY P M, OGUNTOYE M O, et al. Pilonidal disease in a military population: how far have we really come? [J]. American journal of surgery, 2014, 207(6): 907-914.
- [37] HOSSEINI S V, BANANZADEH A M, RIVAZ M, et al. The comparison between drainage, delayed excision and primary closure with excision and secondary healing in management of pilonidal abscess[J]. International journal of surgery (London, England), 2006, 4(4): 228-231.
- [38] AL-KHAMIS A, MCCALLUM I, KING P M, et al. Healing by primary versus secondary intention after surgical treatment for pilonidal sinus[J]. The Cochrane database of systematic reviews, 2010, 20(1): CD006213.
- [39] KÄSER S A, ZENGAFFINEN R, UHLMANN M, et al. Primary wound closure with a Limberg flap vs. secondary wound healing after excision of a pilonidal sinus: a multicentre randomised controlled study[J]. International journal of colorectal disease, 2015, 30(1): 97-103.
- [40] RUFFO B E, ANORECTAL A. IN: CORMAN ML, et al. Corman's Colon and rectal surgery[M]. 6th ed. Philadelphia, PA: Lippincott Williams & Wilkins, 2013.
- [41] AYDEDE H, ERHAN Y, SAKARYA A, et al. Comparison of three methods in surgical treatment of pilonidal disease[J]. ANZ journal of surgery, 2001, 71(6): 362-364.
- [42] ERSOY O F, KARACA S, KAYAOGLU H A, et al. Comparison of different surgical options in the treatment of pilonidal disease: retrospective analysis of 175 patients[J]. The Kaohsiung journal of medical sciences, 2007, 23(2): 67-70.
- [43] PETERSEN S, KOCH R, STELZNER S, et al. Primary closure techniques in chronic pilonidal sinus: a survey of the results of different surgical approaches[J]. Diseases of the colon and rectum, 2002, 45(11): 1458-1467.
- [44] MILONE M, VELOTTI N, MANIGRASSO M, et al. Long-term follow-up for pilonidal sinus surgery: a review of literature with metanalysis[J]. Surgeon, 2018, 16(5): 315-320.
- [45] KAYA B, ERIS C, ATALAY S, et al. Modified Limberg transposition flap in the treatment of pilonidal sinus disease[J]. Techniques in coloproctology, 2012, 16(1): 55-59.
- [46] BASCOM J, BASCOM T. Failed pilonidal surgery: new paradigm and new operation leading to cures[J]. Failed pilonidal surgery: new paradigm and new operation leading to cures, 2002, 137(10): 1146-1150.
- [47] 于锦利, 段宏岩, 蔡姮婧, 等. 臀沟中线小凹切除术治疗骶尾部藏毛窦伴大范围感染[J]. 山西医科大学学报, 2015, 46(4): 368-370.
- [48] BASCOM J. Pilonidal disease: long-term results of follicle removal[J]. Diseases of the colon and rectum, 1983, 26(12): 800-807.
- [49] DELSHAD H R, DAWSON M, MELVIN P, et al. Pit-picking resolves pilonidal disease in adolescents[J]. Journal of pediatric surgery, 2019, 54(1): 174-176.
- [50] MILONE M, FERNANDEZ L M, MUSELLA M, et al. Safety and efficacy of minimally invasive video-assisted ablation of pilonidal sinus: a randomized clinical trial[J]. JAMA surgery, 2016, 151(6): 547-553.
- [51] 金磊, 吴炯, 王振宜, 等. 1470 nm 环形激光消融闭合术治疗骶尾部藏毛窦的临床疗效观察[J]. 结直肠肛门外科, 2021, 27(6): 603-606.
- [52] PAPPAS A F, CHRISTODOULOU D K. A new minimally invasive treatment of pilonidal sinus disease with the use of a diode laser: a prospective large series of patients[J]. Colorectal disease: the official journal of the Association of Coloproctology of Great Britain and Ireland, 2018, 20(8): 0207-0214.
- [53] HARJU J, SÖDERLUND F, YRJÖNEN A, et al. Pilonidal disease treatment by radial laser surgery (FilaC™): The first Finnish experience[J]. Scandinavian journal of surgery: SJS: official organ for the Finnish Surgical Society and the Scandinavian Surgical Society, 2021, 110(4): 520-523.
- [54] DESSILY M, DZIUBECK M, CHAHIDI E, et al. The SiLaC procedure for pilonidal sinus disease: long-term outcomes of a single institution prospective study[J]. Techniques in coloproctology, 2019, 23(12): 1133-1140.
- [55] LI Z C, JIN L, GONG T Y, et al. An effective and considerable treatment of pilonidal sinus disease by laser ablation[J]. Lasers in medical science, 2023, 38(1): 82.
- [56] MILONE M, MUSELLA M, DI SPIEZIO SARDO A, et al. Video-assisted ablation of pilonidal sinus: a new minimally invasive treatment - a pilot study[J]. Surgery, 2014, 155(3): 562-566.
- [57] VELOTTI N, MANIGRASSO M, DI LAURO K, et al. Minimally invasive pilonidal sinus treatment: a narrative review[J]. Open medicine (Warsaw, Poland), 2019, 14: 532-536.
- [58] YARDIMCI V H. Outcomes of two treatments for uncomplicated pilonidal sinus disease: Karydakis flap procedure and sinus tract ablation procedure using a 1, 470 nm diode laser combined with pit excision[J]. Lasers in surgery and medicine, 2020, 52(9): 848-854.
- [59] JABBAR M S, BHUTTA M M, PURI N. Comparison between primary closure with Limberg flap versus open procedure in treatment of pilonidal sinus, in terms of frequency of post-operative wound infection[J]. Pakistan journal of medical sciences, 2018, 34(1): 49-53.

[收稿日期: 2024-05-29]

(编辑: 龙冰霜)