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· 防治实践 ·

# 左上颌第二磨牙近颊三根管根管治疗1例并文献回顾

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**【摘要】** 目的 探讨近颊根三根管的临床诊疗要点, 为临床提供参考。方法 在对患有牙髓炎的左上第二磨牙进行根管治疗的过程中, 通过牙科显微镜下根管探查及锥形束CT(cone beam CT, CBCT)辅助影像学检查, 明确了左上第二磨牙含有3个牙根、5个根管, 其中近颊根有第三根管的存在。结合完善的根管预备、清理、消毒、充填和微创的嵌体修复, 消除了患者的临床症状; 治疗后随访并进行相关文献复习。结果 1年及2年随访时患者均表示患牙无不适, 可正常使用; X线片示充填完好, 根尖周组织无异常。回顾相关文献结果表明, 上颌第二磨牙近颊3根管发生率为0.11%~4.2%, 单纯通过X线片很难发现额外根管, 医师应通过CBCT、手术显微镜等检查进一步确定根管的数量与解剖形状; 当上颌磨牙存在近颊3根管时, 医师应避免过度预备, 根管治疗过程中保留更多的健康牙体组织是预后良好的关键。结论 对上颌第二磨牙近颊3根管进行根管治疗时, 临床医师需充分考虑根管的解剖变异, 借助CBCT检查, 综合使用手术显微镜、超声及各种辅助器械来定位和治疗变异根管。

**【关键词】** 上颌第二磨牙; 解剖变异; 近颊第三根管; 根管治疗; 口腔手术显微镜; 锥形束CT; 数字化模型; 计算机辅助设计/计算机辅助制造; 全瓷修复; 嵌体

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**Root canal treatment of maxillary second molar with three mesial buccal root canals: a case report and literature review** MEI Xiaohan, LIU Jin, HONG Tao, YOU Suxia, CHENG Xiaogang, TIAN Yu. State Key Laboratory of Military Stomatology & National Clinical Research Center for Oral Diseases & Shaanxi Key Laboratory of Stomatology, Department of Operative Dentistry and Endodontics, School of Stomatology, the Fourth Military Medical University, Xi'an 710032, China

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**【Abstract】 Objective** To explore the key points of clinical diagnosis and treatment of three mesiobuccal root canals. **Methods** In the procedure of endodontic therapy for the upper left second molar with pulpitis, through root canal exploration under a dental microscope and cone beam CT (CBCT)-assisted imaging examination, it was confirmed that the left upper second molar contained 3 roots and 5 root canals, among which the third root canal existed in the mesio-buccal root. Combined with perfect root canal preparation, cleaning, disinfection, filling and minimally invasive inlay repair, the clinical symptoms were eliminated. The patients were followed up and the related literatures were reviewed. **Results** One- and two-year follow-ups showed that the tooth had no discomfort and could be used normally. X-ray revealed that the filling was complete, and the periapical tissue was normal. The results of the literature review showed that the incidence of three mesiobuccal root canals in maxillary second molars was 0.11%-4.2%. It is difficult to find ad-

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ditional root canals only by X-ray imaging. Dentists should further determine the number and anatomical shape of root canals by CBCT and operating microscopy. When there are three mesiobuccal root canals in maxillary molars, dentists should avoid overpreparation. Healthy tooth tissue is the key to good prognosis. **Conclusion** During root canal therapy, clinicians should consider the anatomical variation of the root canal, should always be alert to the existence of an extra root canal, and should use CBCT, operating microscopy, ultrasound and various auxiliary instruments to locate and treat the variant root canal.

**【Key words】** maxillary second molar; anatomic variation; third mesiobuccal root canal; root canal treatment; dental operating microscope; cone beam CT; digital model; computer aided design/computer aided manufacturing; ceramic restoration; inlay

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根管治疗是治疗牙髓病及根尖周病的主要方法,其成功取决于正确的诊断、了解根管系统解剖结构、彻底清创和严密充填。而对根管系统解剖结构不熟悉是根管治疗失败的主要原因之一<sup>[1]</sup>,对于一些特殊病例很难准确分辨特殊解剖结构,盲目的治疗容易导致治疗失败。

上颌第二磨牙通常具有3个牙根和3个根管,但其根管解剖形态变异较多,在诊断和治疗过程中,医师一定要意识到其解剖结构的多样性<sup>[2-3]</sup>。早年很多学者已对上颌第二磨牙的根管解剖做了大量研究,分析了其解剖的变异性<sup>[2,4,5]</sup>。本文报道1例冠根一体化修复患牙髓炎的左上颌第二磨牙,为3根5根管型,其中近颊根有Ⅲ-Ⅱ型3根管,本研究通过病例展示其解剖特点,并对根管治疗过程进行讨论。

## 1 资料和方法

### 1.1 病历资料

患者,男,31岁。因左上后牙自发痛、咬合不适2月余就诊。患病以来左上后牙遇冷刺激疼痛不适,并有夜间痛,未治疗。患者自述既往体健,否认全身系统性疾病,否认用药史及过敏史。

专科检查:27近中邻殆面明显龋坏,龋坏深及牙本质深层,冷刺激持续性疼痛,探诊(++),叩诊(±),松动(-),颊侧牙槽黏膜未见肿胀或瘘管。X线片示:27近中邻殆面牙体组织密度减低影,靠近髓腔,根尖周组织未见明显异常(图1a)。诊断:27不可复性牙髓炎。治疗计划:行27根管治疗、计算机辅助设计/计算机辅助制造(computer aided design/computer aided manufacturing, CAD/CAM)全瓷嵌体修复。患者同意按该方案治疗以及对本研究

知情同意。

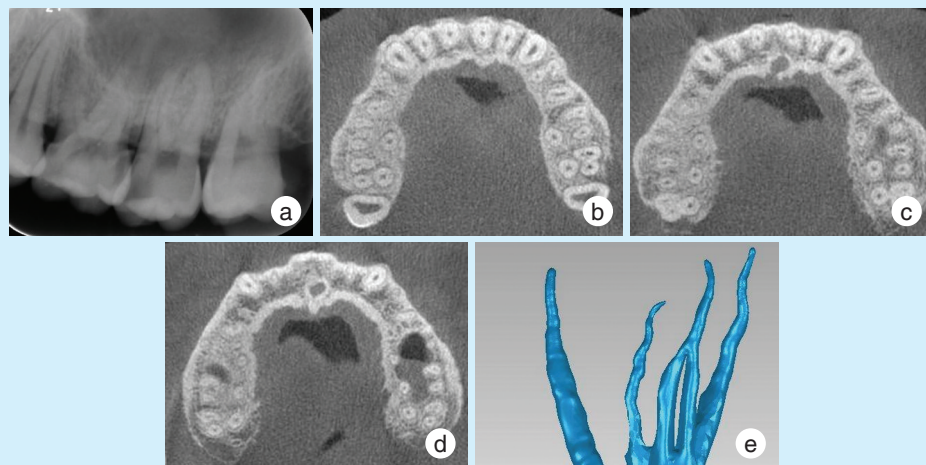
### 1.2 治疗过程

4%盐酸阿替卡因肾上腺素注射液(艾龙,法国)1.8 mL行局部浸润麻醉,27安放橡皮障,牙科显微镜(OMS2350,速迈,中国)下涡轮机去龋,开髓,揭髓顶,安全车针(Endodontics-Z,登士柏西诺德公司,瑞典)髓室修整。10#不锈钢K锉(K-file, MANI公司,日本)初步探查并疏通近颊、远颊及腭根3根管,使用镍钛开口锉(Mtwo, VDW, 德国)扩大根管口,3%次氯酸钠冲洗,干燥后可见近颊根管口腭侧1 mm处仍有部分牙髓组织,使用超声设备(P5 Newtron, ACTEON 赛特力, 法国)ET20超声工作尖完全去除牙髓组织,使用DG16探针可探及近颊第二根管口(second mesiobuccal root canal, MB2),使用根尖定位仪(VDW RAYPEX6, VDW, 德国)确定根管工作长度,其中近颊根(mesiobuccal root canal, MB)18.5 mm,远颊根(distobuccal root canal, DB)20.5 mm,腭根(palatal root canal, P)20 mm, MB2 18 mm。使用机用旋转镍钛器械(Waveone Gold, 登士柏西诺德, 瑞典)根管成形,酸性水超声荡洗根管,干燥后可见MB2腭向仍存在一细小纵沟,怀疑存在更多的根管,为明确根管解剖形态,暂封窝洞后嘱患者拍摄锥形束CT(cone beam CT, CBCT)并制作了根管系统的数字化模型。

CBCT(HiRes 3D, 朗视, 中国)显示:27为3根牙,近颊存在独立的第三根管(third mesiobuccal root canal, MB3)(图1b-1d)。数字化模型显示:MB与MB2于根中下1/3处融合,远颊根、腭根均为单根管。于是,再次安置好橡皮障后如前所述的方法对MB3进行疏通、测长、清理成形,根长为17.5 mm(图1e)。使用不锈钢K锉确定根尖宽度:MB、

MB2、MB3 均为 30#, DB 为 35#, P 为 40#(图 2)。17%EDTA 冲洗根管 30 s,生理盐水冲洗 40 s,3%次

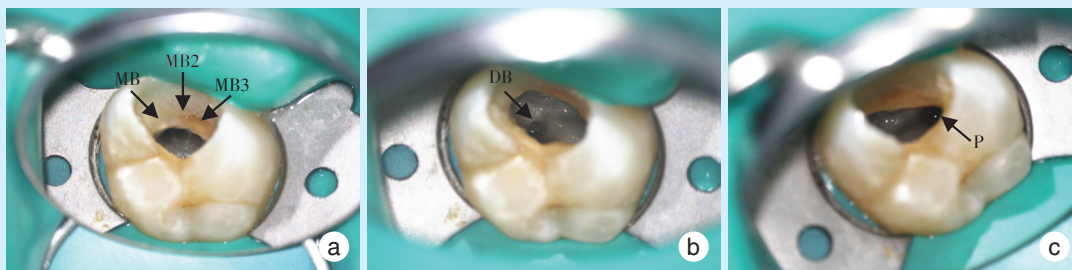
氯酸钠冲洗 30 s,终末超声荡洗,无菌纸捻干燥根管后,氢氧化钙糊剂封药。



a: pretreatment radiographs showed radiolucency on the mesial area; close to the pulp chamber, the periodontal ligament lacuna was widened, and there was no obvious abnormality in periapical areas; b-d: CBCT coronal views show five root canals of the left maxillary second molar, 3 mesiobuccal, 1 distobuccal and 1 palatal root canal. MB and MB2 were fused in the middle and apical parts of the root; e: the digital model showed 27 distobuccal canals on the right that were slightly curved, the palatal canal on the left, and 3 root canals in the mesiobuccal area. MB and MB2 were fused in the middle and apical parts of the root. CBCT: cone beam computed tomography; MB: mesiobuccal root canal; MB2: second mesiobuccal root canal

Figure 1 Diagnosis of the root canal anatomies of 27

图1 明确27根管解剖形态



a: three mesiobuccal root canals, indicated by the arrows; b: distobuccal root canal, indicated by the arrows; c: palatal root canal, indicated by the arrows; MB: mesiobuccal root canal; MB2: second mesiobuccal root canal; MB3: third mesiobuccal root canal; DB: distobuccal root canal; P: palatal root canal

Figure 2 Occlusal view of the root canal after cleaning and shaping of 27

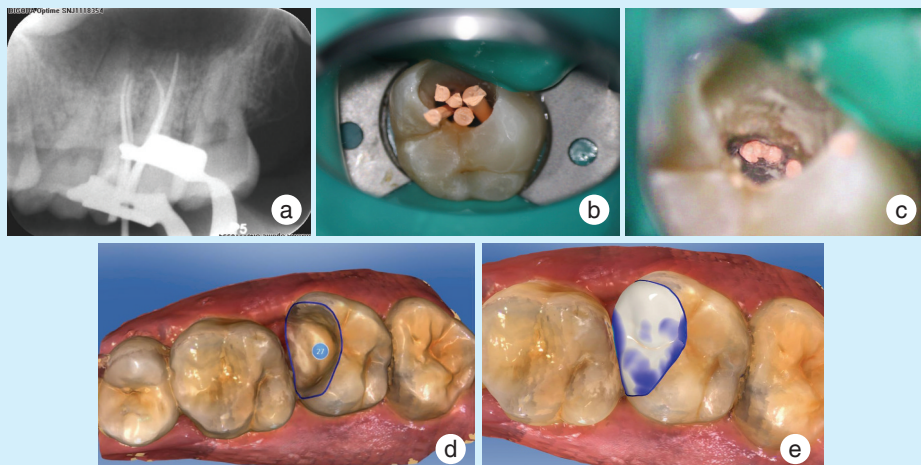
图2 27根管清理成形后口内照

10 d后复诊,超声荡洗根管去净封药,选择尖端直径合适的04锥度牙胶尖拍摄试尖X线片,确认主尖合适,使用AHplus糊剂(Maillefer,登士柏,德国)和04锥度牙胶尖试尖,热熔牙胶垂直加压行根管充填,Cavit™ G暂封窝洞,拍摄X线片示根充恰填。患者治疗1周后复诊,无不适,去暂封后使用3M流动树脂和Z350纳米树脂窝洞垫底,行全瓷

嵌体牙体预备,CAD/CAM嵌体修复,试戴合适,充分隔湿并保护邻牙后,酸蚀、涂布粘接剂,3M树脂水门汀粘接嵌体,调整咬合、抛光。见图3。

## 2 结果

根管充填术后即刻X线片示根充严密、恰填;全瓷嵌体粘接后,修复体边缘光滑、密合、无悬突,



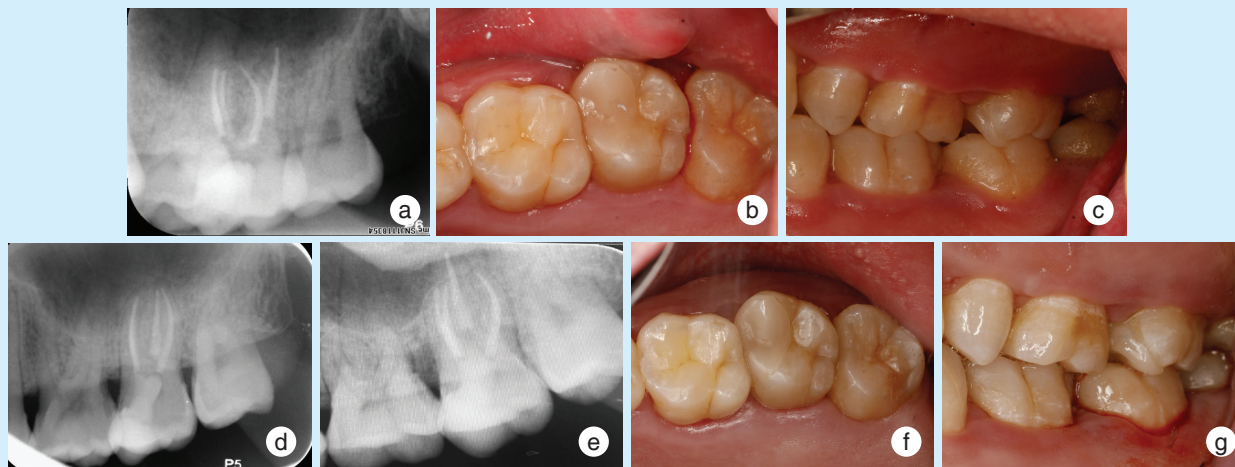
a: radiographs showed that the main gutta-percha was suitable and the distal buccal roots were curved; b: occlusal view of five main gutta-percha; c: an occlusal view showing obturation of 3 mesiobuccal root canals; d-e: design and manufacture of CAD/CAM all-ceramic inlay; CAD/CAM: computer aided design/computer aided manufacturing

Figure 3 Treatment process of 27 with three mesiobuccal canals after root canal therapy

图3 27近颊三根管根管治疗过程

咬合及邻接关系良好。患者治疗后1年复诊,X线片示27牙周膜清晰、连续,根尖周无异常。治疗后2年复诊,X线片及口内照显示:27根管预后良好,

嵌体边缘密合,患牙无不适症状,无崩瓷,无继发龋,无隐裂。见图4。



a: postoperative X-ray showed that the filling was precise and accurate; b-c: after bonding, the occlusal view showed that the edge of inlay 27 was tightly closed and that the occlusion function was normal; d: one year after treatment, the X-ray showed that the periodontal ligament was clear and continuous, and there was no abnormality around the apex; e: two years after treatment, X-ray showed that 27 had good root canal prognosis; f-g: in the intraoral photographs two years after treatment, the edge of the inlay was close, and the affected teeth had no discomfort, no porcelain collapse, no secondary caries and no cleft

Figure 4 Postoperative situation of 27 with three mesiobuccal canals after root canal therapy

图4 27近颊三根管根管治疗后情况

### 3 讨论

上颌第二磨牙通常具有三个牙根,近颊根、远颊根和腭根,总发生率在73.6%~94.6%之间<sup>[6]</sup>,且

多为单根管。研究认为上颌第二磨牙近颊根3根管发生率在0.11%~4.2%<sup>[7]</sup>。Ng等<sup>[8]</sup>在77颗上颌第二磨牙中发现2个近颊根3根管,其分型为1-3-1。

Suresh等<sup>[9]</sup>报道1例右上颌第二磨牙牙根虽是一个融合根,但它具有近颊3根管。而Zhao等<sup>[10]</sup>发现1例右上颌第三磨牙4根5根管型,近颊根具有3根管且MB与MB2在根尖处融合。Ozcan等<sup>[11]</sup>发现右上颌第二磨牙近颊根有3根管,其中MB2和MB3在根尖处融合。Ahmad等<sup>[12]</sup>通过对上颌第一磨牙和上颌第二磨牙近颊根根管分型的研究认为近颊根发生3根管的概率左侧和右侧并无差别。本病例中患者的两侧上颌第二磨牙均有3个牙根——近颊根、远颊根、腭根,其中远颊根和腭根均为单根管,左上第二磨牙近颊根为Ⅲ-Ⅱ型3根管,MB与MB2在根管中下段融合,而右上颌第二磨牙近颊根为独立2根管,MB较为扁长,这与之前报道的病例均有所不同。

术前医师仅通过单张X线片很难发现额外根管,通常可以拍摄不同角度的术前片以辅助探查额外根管解剖结构。但根尖片只能提供二维影像,有时无法发现某些复杂的解剖形态<sup>[13-14]</sup>。随着CBCT在口腔内的使用,可获得根管的三维影像,能更直观的判断根管形态,提高临床诊断并避免过度去除健康牙体组织<sup>[15-16]</sup>。尽管CBCT扫描比常规CT扫描辐射剂量小,但是与传统的口腔内X光片相比,它确实还是会患者暴露于更多的放射线中<sup>[17]</sup>。美国牙髓病学会(AAE)和美国口腔颌面放射学会(AAOMR)建议在初次治疗,如果怀疑存在额外根管或者复杂的形态学特征时,小视野CBCT为首选。在本病例中,手术显微镜显示除了MB和MB2根管外还存在一条纵沟,怀疑存在异常解剖,于是进行了CBCT检查确定根管的形状和数量,以指导进一步的治疗,另外,在显微镜下使用超声仪器去除继发性牙本质悬突,建立直线通路,观察髓室底形态及探查根管口,便可顺利找到额外根管口。

当上颌磨牙近颊根有3根管时,预备过程中应避免过度切削导致根管壁变薄、或穿孔<sup>[18-19]</sup>。本病例中使用04锥度的预备器械,沿根管走向预备根管,避免过度预备造成的根管偏移,尽量保留了根管间的牙本质壁。根管充填时还应充分考虑上颌第二磨牙近颊根根管形态分型。如果根管有融合,应将较粗大的根管充填至工作长度,而其余充填至融合处,确保封闭严密以提高治疗成功率。

在传统根管治疗中,提倡完全揭除髓室顶,建立器械进入根管的直线通道。然而传统的根管治疗,去除了过多的牙本质,尤其是颈周牙本质的去

除,降低了牙齿的抗折性<sup>[20-21]</sup>。有文献指出根管治疗后牙齿折裂率明显增加,约有13.4%发生折裂<sup>[22]</sup>。Clark等<sup>[23]</sup>在2010年首次提出了颈周牙本质的概念,其定义是指位于牙槽嵴顶上下4mm间的牙本质,即髓腔四周及根管中上段的牙本质结构。此范围间的牙本质结构的完整性被认为是牙髓治疗术后患牙能否长期保存并行使功能的关键。因此有学者指出在根管治疗过程保留更多的健康牙体组织是维护牙体治疗长期效果的关键因素。本病例治疗全程在显微镜下操作,采用微创的方法去龋、备牙,极大程度的保留了健康的颈周牙本质及牙体组织,增强了牙体组织的抗力性。根管治疗术中采用EDTA和次氯酸钠大量冲洗,配合超声设备的使用,直视下去净龋坏及牙髓组织,以确保完全清创。根管充填完成后使用流动树脂和纳米树脂填平髓室内倒凹,保留了剩余的健康牙尖,及颊腭侧和远中边缘嵴,制备CAD/CAM全瓷嵌体,完成了微创的牙体修复,完好的恢复近中邻接关系。

**【Author contributions】** Mei XH collected case material and wrote the article. Liu J, Hong T, You SX and Cheng XG revised the article. Tian Y reviewed the article. All authors read and approved the final manuscript as submitted.

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