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义齿粘附剂在口腔修复中的应用*

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摘要:随着全球人口老龄化趋势的不断加剧,老年人群口腔疾病的发病率也随之上升。以我国为例,每年因牙列缺损或牙列缺失而接受治疗的患者数量不断增加。无论何种修复体,义齿的固位和稳定一直是口腔医生和患者评价修复体成功与否的最直观的标准。如何提高义齿的固位和稳定是口腔专业工作者长期关注并研究的主题。义齿的固位与稳定可以通过多种方式进行强化。义齿粘附剂(DA)是用来辅助粘膜支持式义齿(包括全口义齿)固位的方法之一。本文通过阐述义齿粘附剂提高义齿固位与稳定的机理,探讨不同类型的义齿粘附剂对口腔环境的影响,对义齿粘附剂在口腔修复学科应用的现状及发展作一综述,以利于 DA 的使用与推广。

关键词:义齿粘附剂;固位;稳定

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Application of Denture Adhesive on the Prosthodontics*

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ABSTRACT: With the serious tendency of population aging over the world, the incidence of stomatology in the elder people has increased rapidly. For example, the numbers of patients with the deflection of dentition in China have aroused to a high rate. The intuitive standard for evaluating the effects is the retention and stability of denture in spite of the prosthesis' types. What's more, the endeavor to improve the denture retention and stability has been the theme of stomatology for many years. The retention and stability of denture can be enhanced by different methods. The denture adhesive (DA) is localize effective way to make the mucosal supported denture more stable. In this paper, we elaborated the mechanism of denture adhesive in terms of improving the retention and stability for denture by means of reviewing the types of DA and the influence to the oral environment so as to discuss the present situation of DA and the development for application.

Key words: Denture adhesive; Retention; Stability

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义齿粘附剂(denture adhesive, DA)是一种市售的,无毒的可溶性材料,涂布于义齿基托组织面后可在基托与承托区黏膜间产生粘附力,以暂时性提高全口义齿的固位和稳定,增加咬合力和咀嚼效能,具有便利、有效、实用、安全和易于推广等优点^[1,2]。目前,DA 主要是被国外的医生和患者接受,并被大量推广使用^[3,4],但是国内临床应用较少^[5]。

1 义齿粘附剂的发展历程

义齿粘附剂的使用最早可以追溯到 18 世纪末,但是直到 1913 年才出现了第一个专利,随后的二三十年,牙科医生们相继申请了许多不同种类的义齿粘附剂的专利,但直到 1935 年牙科文献上才第一次报道了 DA^[6,8]。多年来,义齿粘附剂的使用在牙科学术界以及临床应用方面,存在着很多的争议^[9]。一些牙医总是尽量避免给患者应用义齿粘附剂,以免患者误解成是因为医生的专业技术不好才用其辅助^[10]。随后,大量的文献研究

表明了义齿粘附剂的优点,揭示了牙医在对待义齿粘附剂态度的变化^[11-14]。现今义齿粘附剂被公认为是义齿制作阶段以及义齿应用阶段的有效辅助手段^[7,14]。

2 义齿粘附剂的分型

多年来许多牙医致力于义齿粘附剂的研究,根据患者的不同需求以及原材料的特性,牙科医生们研制出多种类型的义齿粘附剂,现总结前人的研究成果,得出下表^[6,15]。

3 义齿粘附剂对固位与稳定的影响

1954 年,Dewar^[16]等在研究唾液的物理性能和酶活性的实验中,得出水的表面张力远远大于唾液的表面张力,义齿粘附剂的固位能力显著大于唾液的固位能力。1971 年,Stafford 和 Russel^[17]通过无线电遥测技术测试在使用和不使用义齿粘附剂的情况下义齿与粘膜接触界面的压力的变化,他们发现使用义

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表 1 义齿粘附剂的类型及特点

Table 1 Types and characteristics of denture adhesive

类型(Types)		区别点(Differences)
按成分 According to the composition	动植物胶类 Animal and plant gum	前两者在自然界中天然存在,具有高度的水溶性,易于从义齿表面清除,固位效果不是很理想,易受口腔内环境及进食种类的影响,某些种类具有特殊的气味。后者通过化学合成,可以人为的调整粘度,气味等。固位效果好,相对不易清除,不受口腔环境及进食种类的影响
	纤维素类 Cellulose	The first two natural exist in nature, has high water solubility, easy to remove from the surface of denture, retention effect is not very ideal, vulnerable to the oral environment and influence eating species, some species with special odor. The latter by chemical synthesis, can adjust the viscosity of man-made, smell. The retention effect is good, relatively difficult to remove, is not affected by the oral environment and influence eating species
	高分子聚合物 Polymer	
按剂型 According to the dosage form	粉状 Powdery	粉剂口感相对比后两者的差,持续固位时间较短。后两者口感较好,持续固位时间较长。前两者较易于从义齿上去除,可以通过冲刷即可。后者较难去除。三者的固位和稳定性没有显著的差异
	霜状 Cream	Powder taste relative difference ratio, retention time is relatively short duration. They taste better, last longer retention time. The former two are easy to remove from the denture, can wash can be. The latter is difficult to remove. No significant differences between three retention and stability
	膏状 Paste	

齿粘附剂能够允许患者使用更大的咬合压力。1980 年, Tarbet 和 Crossman^[18]通过临床试验证实了义齿粘附剂可以增强患者的咀嚼能力, 自信心, 以及舒适度, 减少义齿的摆动, 同时减少义齿下方积存的食物残渣。随后 Tarbet^[19]等又进行了进一步的实验研究, 他们通过测定特定患者的咬合能力, 特定患者的共同特点是义齿下方的组织不能为义齿提供良好的固位和稳定。结果表明: 当使用义齿粘附剂时这类患者的咬合力与具有良好的支持组织的患者的咬合力是相近的。主观上, 义齿粘附剂增加了这类患者的自信心; 客观上, 义齿粘附剂的使用可以提高患者的切咬和咀嚼食物最大咬合力的限制。1984 年, Chew^[20]等通过实验证实: 义齿粘附剂可以提高适合的义齿以及不良的义齿的固位和稳定, 其作用在不良的义齿中尤为突出。Grasso^[19]发现, 在使用义齿粘附剂后患者可以产生显著的更高水平的切咬力可长达 8 小时。2002 年, Fujimori^[21]等测量不同情况的义齿基托承托组织条件下的全口义齿的咀嚼能力, 使用义齿粘附剂可以提高所有患者的最大咬合力以及提供规律的肌肉运动, 但是在增强咀嚼效率方面那些支持组织不良的患者更为显著。2003 年, Hasegawa^[22]等也做了类似的研究, 他们评估了使用义齿粘附剂后义齿的三维旋转运动以及随后对咀嚼功能的影响。结果表明义齿粘附剂有助于减少义齿在行使功能时的不良运动从而提高义齿的功能。Hecker、Sumita Y 等^[23-25]先后评估义齿粘附对接受上颌骨切除术的无牙颌患者的影响。他们的结论是: 义齿吸附剂能明显提高上颌骨切除术的病人的咀嚼效率和发音的清晰度, 从而提高患者的生活质量。随后, Sumita Y^[23]又做了进一步的实验, 证明义齿粘附剂的作用效果取决于患者剩余的上颌骨牙槽嵴骨量。

4 义齿粘附剂的刺激性与细胞毒性

研究表明, 义齿粘附剂对口腔环境及咀嚼系统有着不容忽视的影响, 必须正确使用义齿粘附剂, 并通过不断的体内体外的实验研究来确定各种义齿粘附剂的刺激性及细胞毒性, 从而

使其能够应用于临床。

5 义齿粘附剂的双面性

研究表明, 义齿粘附剂能够增强义齿的固位与稳定^[4,36-38]; 可以简化义齿部件应用于特殊的患者, 例如患有触觉和运动功能障碍的患者^[39]。如果使用得当, 可以给患者提供心理上的帮助^[4], 增加咬合力^[41,42], 提高上颌义齿的最大切力^[43], 提高患者主观的咀嚼能力^[40]。

此外, 义齿粘合剂可以用于全口义齿确定颌关系时暂基托的辅助固位, 提高制作义齿的精度^[9]。义齿粘附剂能够有效的封闭义齿与其下支持组织间的间隙, 减少食物的存积, 进而预防真菌的生长^[44], 甚至对较密合的义齿也起到类似作用^[45]。义齿粘附剂能促进义齿表面力的均匀分布, 从而减少基托对粘膜的压迫, 减少粘膜表面形成的压迫性溃疡^[19,20,27]。然而, 义齿粘附剂的使用在一定程度上鼓励了基托不密合的假牙的长时间使用, 从而促进剩余牙槽嵴的吸收^[36]。有些义齿粘附剂难以从口腔和义齿上去除, 导致很多患者对其失去信心^[3,11]。义齿粘附剂长期不当使用或者是不能保持良好的口腔卫生, 将会增加念珠菌在口腔定植的风险, 改变口腔正常菌群, 还会对义齿下方的支持组织产生机械性创伤, 导致义齿性口炎^[9,46]。

6 小结与展望

尽管义齿粘附剂的使用及其在修复中产生的作用在临床实践和牙科教育方面存在着诸多争议, 但是这些争议并没有阻碍世界各地数以万计的义齿佩戴者购买这些产品^[9]。事实上, 很多牙医在临床也乐于推荐和使用。有些牙医^[47]利用义齿吸附剂短期应用, 作为义齿初戴期的义齿 - 粘膜调理剂来缩短患者对新义齿的适应时间, 效果显著。但是, 由于世界各地牙科医生以及牙科医学生的知识水平、修复理念、观点和临床经验不同^[48-50], 在一定程度上依然限制了义齿粘附剂更合理使用。因此, 专业牙医应尽早掌握义齿粘附剂的适应证与禁忌证, 正确指导患者

表 2 义齿粘附剂的刺激性和细胞毒性

Table2 The irritation and cytotoxicity of denture adhesive

年代及作者 Time and author	实验内容 Experiment content	实验结论 experimental conclusion
1945, Bartels ^[26]	观察义齿粘附剂对金黄色葡萄球菌和大肠杆菌的抑制作用 To observe the inhibitory effect of denture adhesive on Staphylococcus aureus and Escherichia coli	义齿粘附剂对口腔内的微生物没有影响 there was no effect on the micro-organisms
1962, Woelfel ^[27]	观察义齿基托与粘膜不密合的患者长期使用义齿衬垫材料 和义齿粘附剂的后果 observation of denture base and mucosa is not closed with the long-term use of denture liner material and denture adhesive consequences	长期应用义齿粘附剂会造成义齿下方支持组织不可逆的破坏 long term use of denture adhesive agent will cause irreparable deterioration of the denture supporting tissue
1971, Stafford 等 ^[17]	体外实验观察义齿粘附剂对念珠菌的影响 in vitro experiments to observe the effects of denture adhesive on Candida albicans	义齿粘附剂能够诱导念珠菌的形成并促进其生长 denture adhesive can be induced by Candida and promote its growth
1978, Scher ^[28]	体内研究义齿粘附剂的使用对其支持组织及整个口腔环境的影响 effect of using in vivo study of denture adhesive on the supporting tissues and the oral environment	合理使用义齿粘附剂会降低对支持组织的损伤,减少念珠菌的产生,从而减少义齿性口炎 the rational use of denture adhesive can be reduced to the supporting tissue damage, reduce Candida, thereby reducing denture stomatitis
1984, Boone 等 ^[29,30]	通过实验研究义齿粘附剂对骨骼及咀嚼肌的影响 the experiment study of effect of denture adhesive on skeletal and masticatory muscles	合理使用义齿粘合剂将不增加骨吸收,有助于减缓垂直距离的不利变化,同时也不会造成咀嚼肌在功能活动时的变化 the rational use of denture adhesive will not increase bone resorption, contribute to adverse change slow vertical distance, but also does not cause changes in the functional activity of masticatory muscles
1999, Slaughter ^[9]	运用 Delphi Method 针对学术专业人员进行调查 to use Delphi Method to investigate the academic professionals	长期不适当的使用义齿粘附剂会导致口腔菌群的失调,导致义齿性口炎。 use of denture adhesive long-term inappropriate will result in the imbalance of oral flora, cause denture stomatitis.
2001, Makihiro ^[31]	通过体外实验观察市售的义齿粘附剂对念珠菌增长的影响 in vitro experiments to observe the effects of commercially available denture adhesive on Candida albicans growth	义齿粘附剂具有抗真菌的活性 denture adhesive with antifungal activity
2003, Kim ^[32] 2010, Oliveira ^[33]	通过 14 天的体内实验观察义齿粘附剂对念珠菌的影响 through the experiment in vivo for 14 days to observe the effects of denture adhesive on Candida albicans	在试用期内义齿粘附剂没有显著改变口腔菌群 during the probation period the denture adhesive did not significantly alter the oral microflora
2008, Nations ^[34]	对 4 例患有低铜血症和严重神经疾患的患者惊醒相继的临床资料机实验室资料的对比研究 a comparative study of 4 patients with hypocupremia and severe neurological disorders in patients with clinical data, laboratory data have been awakened by the machine	长期使用含有过量锌的义齿粘附剂可能导致低铜血症和严重的神经系统疾患 long term use of denture adhesive containing excessive zinc could lead to hypocupremia and severe disorders of the nervous system
2012, Sampaio 等 ^[35]	体外研究十种不同剂型的义齿粘附剂对白色念珠菌的影响 in vitro effects of ten different formulations of denture adhesive on Candida albicans	义齿粘附剂能够引起念珠菌及寄生环境的宏观和微观上的变化,甚至有些粘附剂能够抑制念珠菌的生长 denture adhesive can be caused by Candida and parasitic environment of macroscopic and microscopic changes, and even some adhesion agent can inhibit the growth of Candida

规范合理使用义齿粘附剂及其应用期间的口腔护理。义齿粘附剂的相关知识系统也应不失时机地纳入各类教学活动中,以便

更多的医生及医学生能够对其有更加全面的认识,切实提高义齿粘附剂对口腔修复体意义等相关知识的认知水平。

虽然,CAD/CAM 修复体、套筒冠,种植义齿等新技术、新材料、新方法的开发应用目前如火如荼,但是,开发新型义齿粘附剂,生产出刺激性与细胞毒性更低的,可以长期被患者利用而不产生毒副作用的新材料在当今依然有广泛的空间。

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