Quintessentials
口腔临床要点快速掌握系列

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·中英文对照·

牙周病临床评估和诊断程序

Understanding Periodontal Diseases: Assessment and Diagnostic Procedures in Practice

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内容提要

"口腔临床要点快速掌握系列"是国际著名的Quintessence出版社近期出版的介绍口腔各科基本技术和最新医学理论的专业丛书。该丛书自2002年起陆续出版发行，我社第一时间引进，以便让国内读者同步了解国际口腔技术发展的新情况。本书详细介绍了牙周病的发病机制、临床表现以及国际权威的牙周病评估标准和实用的检查方法等。本书可以帮助读者全面正确地评估和诊断牙周疾病，进而提高牙周病的治疗效果。本书采用了中英对照的编排方式，对提高读者的专业英语水平大有裨益。本书适合于临床口腔科医师、技师和口腔医学生阅读。

责任编辑 杨 淮 韩 志

序

对牙周组织和牙周疾病的认识和理解对有效维持口腔卫生健康十分重要。本书是针对全科牙科医生Quintessentials系列丛书的第一册，其通过简洁易读的、权威且有吸引力的论述的牙医们这方面的知识。

本书中每一章内容都包括目的、要点、对正文进行高质量补充的图解说明以及对扩展阅读的建议，这些都是精萃系列丛书吸引人的特点。本书涵盖了丰富的牙周病学信息和治疗指导，这是临床上高质量地治疗牙周病必不可少的。本书适合所有的口腔工作者和口腔医学生。

随着口腔保健意识的提高，患者一生能保留越来越多的牙齿以及这些牙齿拥有更长的寿命，本书中的牙周病学内容是成功临床治疗的重要因素，对那些努力提高患者口腔健康的牙医，本书及Quintessentials系列丛书提供了最有价值的财富——应用最新知识和认识以及牙科学新进展为患者服务的方法。我向您推荐这本优秀的图书。

主 编 **Nairn H F Wilson**

前　言

本书是致力于为全科口腔医师提供治疗牙龈炎和牙周炎全面而实用的治疗指导的五本书中的第一本，本书名为《牙周病临床评估和诊断程序》，它使读者在牙周炎的评估和诊断过程中运用逻辑思维，以避免诊断失误和分辨牙周炎的危险人群。它还对相关的解剖结构和疾病过程中健康和病理状态的临床表征，以及疾病的分类等作出全面的修订总结，从而使读者通过临床诊断原则，包括放射检查和其他特殊检查，达到对牙周疾病诊断的目的。

希望读者在读完本书后能够有以下收获。

- 理解最新的牙周疾病进展、分类和临床过程。
- 理解牙周病易感性评估的概念和易感因素，并能指出由于牙周炎导致失牙患者的易感水平。
- 识别健康和病理牙周组织（在广义的范畴），并能将其按特征分类。
- 诊断普通的牙龈疾病和牙周疾病。
- 通过简单的牙周诊断检查方法，包括放射检查和其他特殊检查，来对疾病进行诊断。
- 通过相应的放射检查对主要的病理变化作出简明的报告。
- 理解特殊牙周病诊断需要的特殊检查及其检查结果的意义。
- 对影响牙周组织的疾病进行广义的分类，并对其进行鉴别诊断。
- 了解牙周疾病的诊断在今后十年可能的发展方向。

Iain L C Chapple
Angela D Gilbert

致　谢

作者真挚地感谢John Strange 医生和Barbara Shearer医生对全书的校对；感谢John Matthews医生对第2章和第3章的校对；感谢Michael Sharland先生和Marina Tipton小姐的摄影技术支持；感谢Rachel Sammon医生提供图2-2，图2-3，图2-4，图2-5，图3-7；感谢H Donald Glenwright先生提供图4-9；感谢John Rippin医生提供图1-1，图1-4，图1-5；感谢Serge Dibart医生提供图1-7和图5-8；感谢Elizabeth Connor及她的同事的放射学技术和材料方面的支持；感谢Paul Hughes先生提供图解说明方面的帮助，感谢Year Book Europe Limited允许使用图6-2和图6-4。

Chapple教授感谢妻子Liz在整个写作过程中对他的支持。Gilbert医生感谢Nigel和她的姐妹Isobell和Joan的不懈帮助。

目　录

第1章 牙周膜

A Whistle-Stop Tour of the Periodontium

目 的

这一章的目的是复习牙周膜的重要解剖学和组织学结构特征。

要 点

通过本章的复习，实践者应能识别在牙周组织检查中需要评估的关键的临床特征，因为它们能帮助进行诊断和制定治疗计划。

牙周组织术语及定位

牙周组织是牙齿的支持组织（或牙附着装置）。它们的作用是防止牙齿受到咀嚼力的损伤和防止炎症感染，促进正常的口腔功能，防止牙齿过早脱落。由于现代医学和健康标准延长了人类的预期寿命，牙周组织不得不行使比它们当初设计时限更长时间的功能。另外，由牙周附着丧失而导致的系统性疾病的本质和严重程度（例如，

Aim

This chapter aims to provide the practitioner with a contemporary review of the important anatomical and micro-anatomical features of the periodontium.

Outcome

At the end of this chapter the practitioner should be able to identify key clinical features that need to be assessed during the examination of patients' periodontal tissues, since these features help inform diagnostic and treatmentplanning processes.

Terminology and Orientation

The periodontal tissues form the supporting apparatus of the teeth. Their role is to protect the teeth from masticatory forces and infection, thereby facilitating normal oral function and preventing premature tooth loss. As modern medicine and standards of health have prolonged human life expectancy the periodontal tissues have to perform these functions over considerably

牙周病与心脏、脑血管疾病之间的关系）以及与更长时间的保留牙齿有关的慢性细菌性刺激才刚开始被人们认识。所以牙龈退缩、牙齿过敏和牙齿松动成为牙医和患者每天面对的问题。健康的牙周组织如图1-1所示，其组成包括：

more years than they were designed for, and therefore recession,sensitivity and tooth mobility are daily management problems for the dental practitioner and patient. Additionally, the nature and extent of systemic problems that are created by a compromised periodontal attachment (e.g.the established link between periodontal disease and cardio-/cerebro-vascular disease) and the chronic microbial stimulus associated with retaining teeth for longer, is only just being realised. The healthy periodontal tissues are identified in Fig 1-1 and comprise:

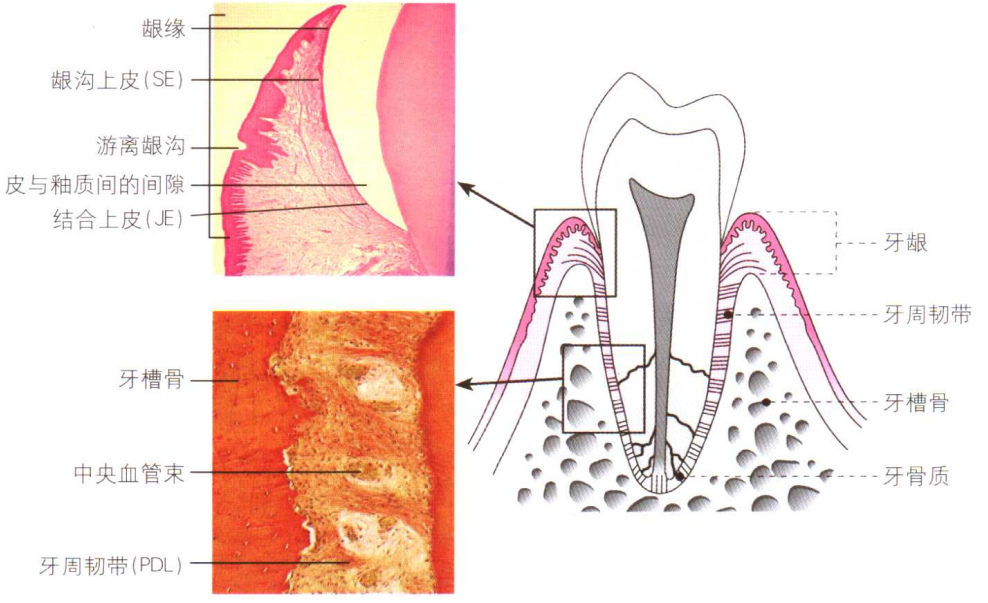

图 1-1　前磨牙牙周组织纵剖面及组织学应用解剖

Fig 1-1 Schematic longitudinal section of a premolar and associated periodontal tissues. Applied anatomy is demonstrated alongside histology (photomicrographs) of key areas.

- 牙龈
- 牙槽骨
- 牙周韧带
- 牙骨质

牙 龈

牙龈包括：

- 龈缘——可见的牙龈边界
- 龈沟——正常龈沟深度为0.5～3 mm
- 游离龈——覆盖于牙槽嵴顶的可动的领圈状或袖口状牙龈
- 附着龈——1～9 mm长，由牙龈-牙复合体的胶原纤维附着于牙槽骨和牙骨质

游离龈向附着龈移行的界限常可见到，在原始状态的健康牙龈上称为龈沟（图1-1和图1-2）。然而由于大多数正常口腔都可探查到一定程度的龈缘菌斑和邻面菌斑，游离龈在组织学上都有一定程度的炎症，所以临床健康和原始状态的健康被认为是不同的状态。在临床健康状态，可能存在非常轻微的炎症，所以不是总能看清龈沟。

- investing gingival complex (gingivae)
- alveolar bone
- periodontal ligament
- root cementum.

The Gingivae

The gingivae comprise:

- a gingival margin – the visible edge of the gingiva
- a gingival sulcus – (or crevice) which in health is between 0.5 and 3mm in depth
- the free gingiva–a mobile cuff of gingiva lying above the alveolar crest
- the attached gingiva–a band of 1-9mm in length, which is bound down to the underlying alveolus and cementum, by collagen fibres of the dentogingival complex.

The line at which the *free gingiva* becomes *attached gingiva* is usually visible, under conditions of *pristine* gingival health, as the *gingivalgroove* (Figs 1-1 and 1-2). However, since the majority of healthy mouths have detectable levels of marginal and interproximal plaque present, they also have a degree of inflammation present histologically, hence *clinical health* and *pristine health* are now recognised as different conditions. In clinical gingival health, it is accepted that there may be very mild inflammation present and the gingival groove is not therefore always discer-

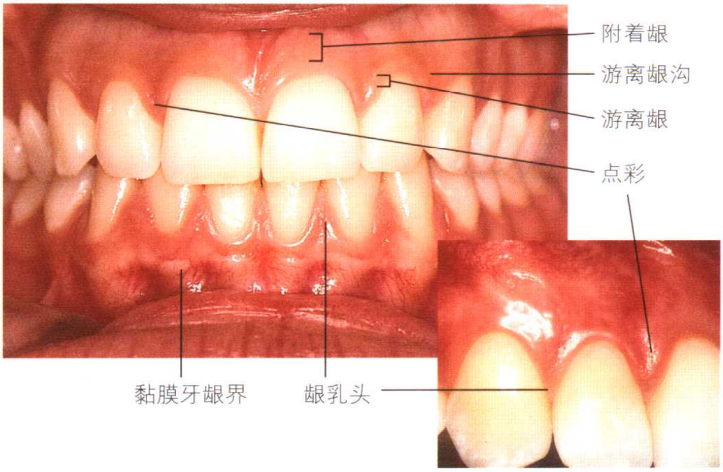

图 1-2 健康牙龈应用解剖特征

Fig 1-2 An anterior view of "pristine gingivae" demonstrating applied anatomical features from Fig 1-1.

牙龈组织是正角化上皮，在健康状态比非角化的口腔衬里黏膜更苍白或粉红。牙龈与口腔黏膜在黏膜牙龈界（MGJ）处相连，由于腭侧黏膜是完全角化上皮，所以在腭侧看不见膜龈联合。过去常常认为当龈缘由口腔黏膜构成（如牙龈退缩时），而不是由角化的牙龈构成时，牙龈边缘对刷牙时的创伤性刺激具有较差的抵抗力，然而，研究表明，在菌斑控制较好时，非角化的口腔黏膜形成的龈缘与角化的牙龈上皮形成的龈缘同样能保持稳定。

nible.

The gingival tissues are orthokeratinised and therefore, in health, appear paler or pinker than the lining oral mucosa, which is non-keratinised. The gingiva joins the oral mucosa at the *mucogingival junction* (MGJ), which is not visible in the palate, since palatal mucosa is entirely keratinised. It used to be thought that when the gingival margin was formed by oral mucosa (e.g.due to recession) rather than keratinised gingiva, the marginal tissues were less robust and resistant to the trauma of toothbrushing. However, studies have shown that a gingival margin formed by non-keratinised oral mucosa is as capable of retaining stability as a margin formed by

游离龈和牙体组织在健康状态下被龈沟分隔，龈沟深度为0.5～3 mm（推荐的探诊力量为20～25 g或0.2～0.25 N）（图1-3）。如果探查健康的龈沟时探诊力量过大，探针将穿过龈沟底，进入结缔组织。健康状态下龈沟内分泌龈沟液（GCF），龈沟液以0.2 μl/h的速度分泌，每天分泌约1 ml并成为唾液的一部分。正常龈沟液是一种血清渗出液，是由牙龈内的动脉毛细血管内的血清被动渗出形成（图1-4），通过牙龈结缔组织进入龈沟（图1-5）。正常情况下，GCF包含血清含有的所有成分（除红细胞外），另外，龈沟液内还可有活性中性多形核白细胞（PMNLs）。炎症感染时，龈沟渗出液更像炎症渗

keratinised gingiva, provided plaque control is good.

The free gingival tissues are separated from the crown of the tooth in health by the *gingival sulcus* or crevice, which on clinical probing varies from 0.5 to 3mm, for recommended probing pressures (20-25g or 0.2-0.25N) (Fig 1-3). If a healthy crevice is probed too firmly, the probe penetrates the base and enters the connective tissues. The crevice is washed out in health by *gingival crevicular fluid* (GCF) which flows out at a rate of 0.2μl per hour contributing lml per day to saliva. GCF is a serum *transudate* in health and is formed by serum moving passively from the arteriolar capillaries of the gingiva (Fig 1-4), through the gingival connective tissues and

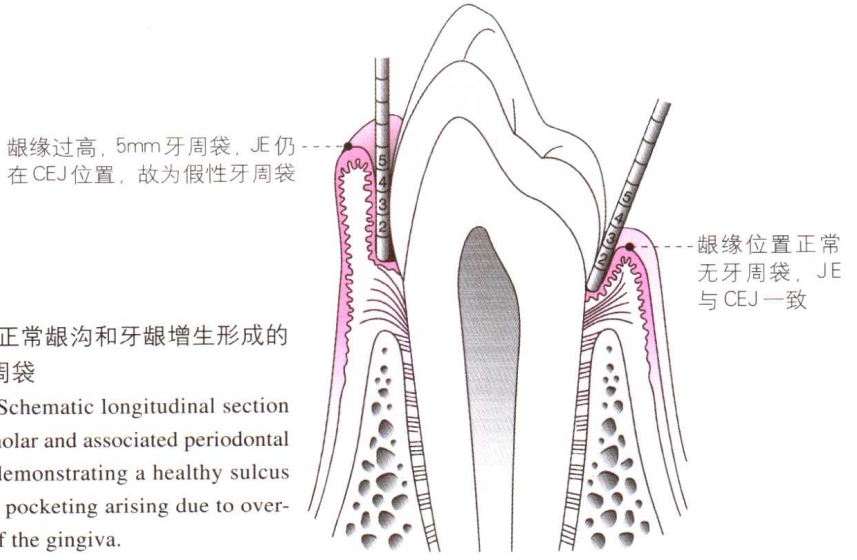

图1-3 正常龈沟和牙龈增生形成的假性牙周袋

Fig 1-3 Schematic longitudinal section of a premolar and associated periodontal tissues, demonstrating a healthy sulcus and false pocketing arising due to overgrowth of the gingiva.

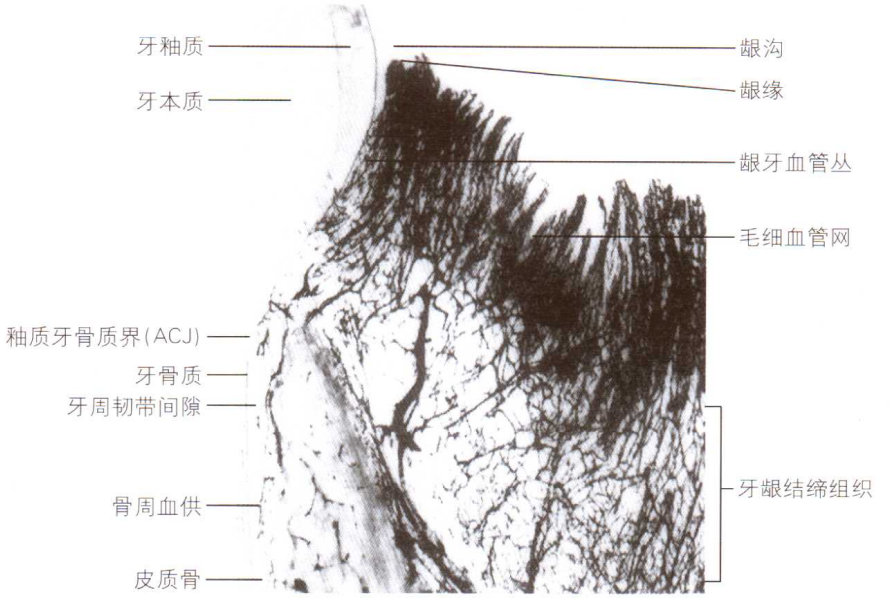

图 1-4　狗牙周膜丰富的牙龈血管染色黑白显微照相。JE 和 SE 下的毛细血管网称为龈牙丛，血清从此进入毛细血管后的静脉或进入龈沟形成龈沟液

Fig 1-4 A black-and-white photomicrograph from the periodontium of a dog following injection of dye to demonstrate the rich gingival vasculature. Large vessels (arterioles) branch off a vast network of capillaries which formloops beneath the connective tissue rete ridges of the oral epithelium. The capillary network beneath the JE and SE is called the dentogingival plexus and serum from this plexus either returns to the post-capillary venules, or it enters the gingival crevice as GCF.

出液，局部的炎症成分进入龈沟液并增加龈沟液的流速和量。

into the gingival crevice (Fig 1-5). In health, GCF contains everything serum contains, except for red blood cells, and, in addition, viable neutrophils (polymorphonuclear leucocytes; PMNLs) can be collected from it. During inflammation, the transudate becomes more like an inflammatory *exudate* and local components of that inflammatory process enter the GCF which increases in flow rate and volume.

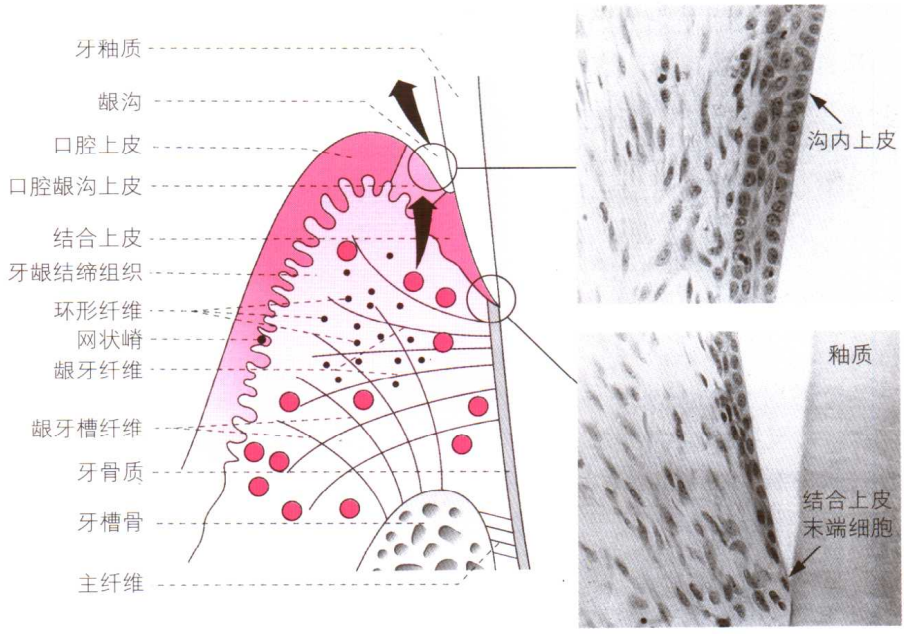

图 1-5 牙龈胶原纤维和 SE 及 JE 的正常组织显微照片。细胞间的距离较宽并逐渐变薄，在结合上皮顶端为单个结合上皮终末细胞

Fig 1-5 A schematic view of the gingivae demonstrating the gingival collagen fibre complexes. The SE and JE are also represented alongside in two photomicrographs demonstrating normal histology. Note how widely spaced the cells are and how they thin out forming a single "terminal cell" of the apex of the JE.

龈沟内衬以高度特异性的上皮组织，称为龈沟上皮（SE）和结合上皮（JE）（图1-5）。正常情况下它们紧紧地附着于牙冠，所以原始健康状态下没有龈沟除非将探针从龈缘置入。结合上皮是一种独特的结构，通过半桥粒附着于骨的内在的部分（被覆有牙槽骨的牙齿）。胚胎学上牙釉质来源于外胚层（内釉上皮），该组织是一种平常的结构。但是一旦出现附着丧失（不管是牙龈退缩还是真性牙周袋形成），结

The gingival crevice is lined by highly specialised epithelia called sulcular epithelium (SE) and junctional epithelium (JE) (Fig 1-5). These normally adhere tightly to the crown, such that in *pristine* health no sulcus exists unless a probe is placed down from the gingival margin. The JE is unique as it forms an epithelial attachment (via hemi-desmosomes) to an internalised part of the skeleton (tooth with its investing alveolar bone). As enamel is derived

合上皮会在来源于间充质的牙骨质上迁移导致牙骨质暴露，结果类似于开放性骨折，骨从上皮内冒出，使人体内部结构暴露于外部环境。结合上皮对于携带有宿主防御细胞（主要是多形核白细胞）和其他各种炎症成分和免疫反应成分如补体和抗体的龈沟液具有渗透性。结合上皮细胞间具有较大间隔以利于龈沟液的渗透，相反这种结构使细菌产物也能进入牙龈组织并刺激炎症反应的发生。健康状态下，该反应被控制，不会出现肉眼可见的炎症反应，但当菌斑在龈下聚集以后，炎症在结合上皮下的牙龈结缔组织内逐步进展最终形成微溃疡，当进行牙周探查时，血液通过微溃疡从牙龈结缔组织内流出进入龈沟，形成探诊出血（BOP）这一重要的临床表征。

from ectoderm embryologically (inner enamel epithelium) such a union is not unusual. However, once attachment loss has occurred (either recession or true pocket formation), the JE migrates onto cementum which is derived from mesenchyme. This results in a situation rather like a compound fracture of bone, where bone emerges from epithelium exposing the internal structures of the body to a hostile external environment. For this reason, the JE is permeable to GCF carrying the host's defence cells (mainly PMNLs) and various other components of the inflammatory/immune response, such as *complement* and *antibody*. The JE cells are widely spaced to facilitate this (Fig 1-5), but the downside of this arrangement is that bacterial products can also pass back into the gingival tissues and stimulate an inflammatory reaction. In health, this reaction is controlled and visible inflammation does not occur. However, as plaque accumulates subgingivally, the inflammation progresses within the gingival connective tissue underlying the JE and the latter eventually develops microscopic ulcers. When probed, blood can pass from the gingival connective tissues via the micro-ulcerations and can enter the crevice, creating the important clinical *sign of bleeding on probing* (BOP).

牙龈上皮

牙龈上皮包括：

- 口腔上皮
- 口腔龈沟上皮
- 结合上皮

口腔上皮（图1-6）是一种复层鳞状上皮，起始于柱状的基底细胞，这些幼芽细胞分裂形成向上进入中心区域的细胞（棘层和颗粒层内的五角/六角形细胞），最终在表层变得扁平并失去细胞核，表层细胞积聚形成称为角蛋白的一种非渗透性蛋白，坏死后沿牙龈表面形成一种无细胞核非渗透性的角化层（正角化）。有超过20种不同类型的角蛋白，这种上皮细胞的角蛋白以它们的来源为特征（例如牙龈上皮表达细胞角蛋白—K1，2，5，6，10，12，16）。基底细胞层在结缔组织脊（称

The Gingival Epithelium

The gingival epithelium comprises:

- oral epithelium
- oral sulcular/crevicular epithelium
- junctional epithelium.

The oral epithelium (Fig 1-6) is a stratified squamous epithelium with several layers, starting with the columnar basal cells. These germinal cells divide to produce cells that move up to the central zone (pentagonal/hexagonal cells within the *stratum spinosum* and *stratum granulosum*), which ultimately flatten at the surface and lose their nuclei. The surface cells accumulate an impermeable protein called keratin and upon death they lie along the gingival surface forming a non-nucleated and impermeable keratinised layer (ortho-

图1-6 牙龈上皮显微照片：柱状基底细胞和棘层星形细胞以及扁平表层角化细胞。注意表层细胞无细胞核且完全角化形成阻止微生物入侵的渗透屏障

（引自Riviere. *Lab Manual of Normal Oral Histology*. Quintessence：Chicago，2000）

Fig 1-6 Photomicrograph of gingival epithelium from the facial surface demonstrating columnar basal cells (just in view) and pentagonal cells of the stratum spinosum, with flattened surface cells which have accumulated keratin. Note the absence of nuclei at the very surface, which is pure keratin and forms the permeability barrier to prevent microbial invasion.

(From Riviere. *Lab Manual of Normal Oral Histology*. Quintessence: Chicago, 2000)