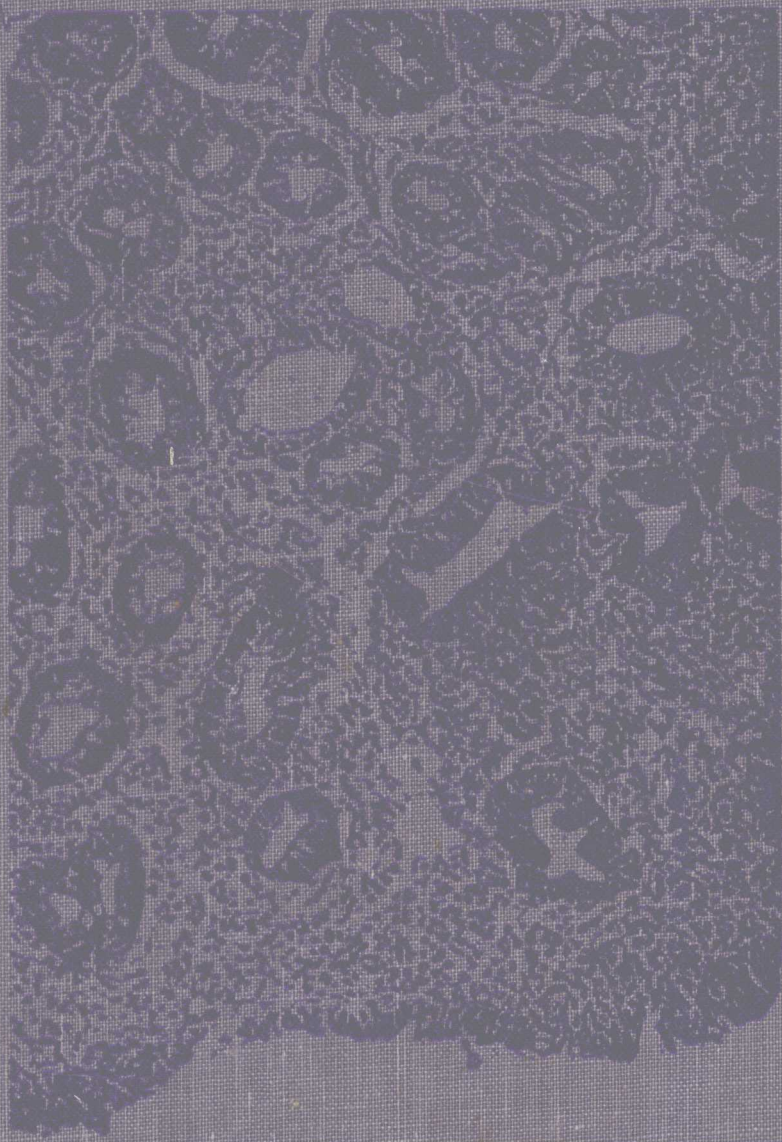


COLOR ATLAS OF

PATHOLOGY

Luigi Giarelli
Mauro Melato
Guglielmo Antonutto

TRANSLATED BY
Ettore De Girolami



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COLOR ATLAS OF PATHOLOGY

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PREFACE

The purpose of this Atlas is to complement the teaching of pathology with a sufficient number of illustrations, so as to help understanding and retaining the information acquired in the lecture hall or at the autopsy table.

A good illustration must convey the appearance of a lesion to the reader in a direct and straightforward fashion, with little need for lengthy descriptions. Since we are convinced that the learning process is "*breve et efficax per exempla*" (brief and efficient through the use of examples), we believe that these photographs will be useful to medical students and physicians interested in pathology.

In addition, we feel, as Erasmus did, that images can be the source of great delight: "Often we can grasp more in an image than we can comprehend in written words." Our aim, then, has been to promote and facilitate the learning process by providing many images of pathologic entities.

I have been motivated not only by the encouragement and support I have received from the publisher and many colleagues but also by the following notion derived from the many years of teaching and love for this subject: "He who does not see does not know; he who does not know does not love."

With this work we intend to offer the chance of observing and learning to recognize pathologic pictures and to promote the student's interest in the field of pathology.

"Nobody can be happy without love" (Ugo di San Vittore) but with love, all learning becomes joyful.

The practice and learning of pathology require a keen interest and a whole-hearted commitment if we are to satisfy the great demands imposed on our specialty by the rapid progress of modern science.

For these reasons, this work is directed both to medical students who wish to increase their knowledge of pathology and to physicians who are pursuing their specialty training, since some knowledge of pathology is essential for most specialties.

The illustrations for this atlas were obtained from autopsy material of the Department of Pathology of the University of Trieste. Most lesions usually considered essential are represented here.

The selection and description of the illustrations were the task of Drs. Antonutto and Melato. I wish to emphasize, though, that the entire staff of the department has cooperated to generate the final product. The authors wish to thank the following physicians: Bianchi, Silvestri, Di Bonito, Grandi, Stanta, Peruzzo, Delendi, and all the younger collaborators in the department. Equally

our acknowledgement goes to our technologists, whose ability has increased the quality of our illustrations. We feel certain that, without the help of the whole team, this Atlas could not have been completed.

To the publisher, who has taken responsibility to present the photographs and the text in pleasing, logical, and clear sequence, we express our gratitude.

Luigi Giarelli

PREFACE to the English edition

The *Color Atlas of Pathology* of Giarelli, Melato, and Antonutto reproduces a careful selection of artistic and instructive illustrations of gross pathologic specimens and photomicrographs which "will be useful to medical students and physicians interested in pathology" (Giarelli).

The photographs include diseases of various organs examined during the daily practice of pathology, as well as conditions that are seen less frequently by the pathologist practicing in the western hemisphere.

Since all the information, both text and illustrations, is included in one volume, readers may find it necessary to seek the specialized literature to expand their knowledge.

Nevertheless, the artistic and scientific beauty of the material presented in this work is not second to previous publications edited with the same aim.

It is with this spirit that my colleagues and I have assumed the task of translating this Italian atlas. The majority of the translators are physicians who graduated from Italian medical schools and specialized in pathology and who are presently affiliated with American university centers. We all have different interests but we paused to cooperate for the translation of this atlas.

The task of the translator is not very rewarding because he must accept and convey the philosophy and concept of the original work, which sometimes may differ from his own, even though many principles of pathology are equally accepted everywhere.

That notwithstanding, it was a learning experience and a personal pleasure, stemming from the deep sentiments of affection toward our Italian educators, to be part of this publication as translators.

I wish to mention that the content of this atlas reflects mainly the opinions of the authors and not of the translators, and it is with this principle that we assumed this task. If there are changes from or additions to the Italian version, these were required to meet the needs of American students and physicians.

We believe it is easier to learn and enjoy the teachings of pathology through beautiful illustrations than by words alone.

"It is impossible even to think without a mental picture" (Aristotle).

So, please: look and learn.

I felt a great joy at having been selected to edit the translation of this atlas. With my colleagues and collaborators I wish to thank the American publisher for the trust that was given to us.

Ettore De Girolami

CONTENTS

- CHAPTER 1 Mouth, upper digestive and respiratory tract, 1**
SERGIO BUCCONI
Translated by: Ettore De Girolami
- 2 Respiratory system, 45**
Translated by: Paola C. De Girolami
- 3 Digestive system, 143**
ESOPHAGUS, 144
Translated by: Agostino Molteni and Loredana Brizio-Molteni
STOMACH, 158
Translated by: Agostino Molteni and Loredana Brizio-Molteni
INTESTINE, 204
Translated by: Agostino Molteni and Loredana Brizio-Molteni
LIVER, 246
Translated by: Ettore De Girolami
EXTRAHEPATIC BILE DUCTS AND GALLBLADDER, 306
Translated by: Luigi Ceccacci
PANCREAS (EXOCRINE), 316
Translated by: Gherardo Gherardi
- 4 Urogenital system, 329**
KIDNEY, 330
Translated by: Pier Luigi Bigazzi
LOWER URINARY TRACT, URETER, BLADDER, URETHRA, 386
Translated by: Pier Luigi Bigazzi
PROSTATE, 397
Translated by: Ettore De Girolami
SEMINAL VESICLES, 402
Translated by: Ettore De Girolami

TESTES, EPIDIDYMIS, AND TESTICULAR ADNEXAL STRUCTURES, 403

Translated by: Ettore De Girolami

OVARY, 412

Translated by: Ettore De Girolami

UTERINE (FALLOPIAN) TUBES, 424

Translated by: Ettore De Girolami

UTERUS, 426

Translated by: Ettore De Girolami

VAGINA, 438

Translated by: Ettore De Girolami

5 Endocrine system, 443

Translated by: Gherardo Gherardi

6 Nervous system, 471

Translated by: Umberto De Girolami

7 Osteoarticular system, 525

Translated by: Luigi Ceccacci

8 Cardiovascular and hemopoietic systems, 541

HEART, 542

Translated by: Guido Majno

BLOOD VESSELS, 589

Translated by: Guido Majno

HEMOPOIETIC SYSTEM, 607

DR. GIOVANNI FALCONIERI

Translated by: Liborio Tranchida

9 Skin, adnexa, and soft tissues, 635

Translated by: Ettore De Girolami

10 Diseases with multiple system involvement, 673

Translated by: Luigi Ceccacci

Chapter 1

MOUTH, UPPER DIGESTIVE AND RESPIRATORY TRACT

Sergio Bucconi

TEETH AND JAWS

DENTAL CARIES

Dental caries is a destructive process of the enamel, dentin, and cement caused by nonspecific microorganisms. It is characterized by (1) demineralization of the inorganic component and (2) destruction of the organic component with cavity formation in the tooth. Dental caries is the most common disease in humans; there are no geographic areas in the world whose inhabitants are exempt, including the most civilized. While etiology and pathogenesis of the disease have been open to discussion, presently it is generally accepted that there are two factors that play an important role in the development of the disease: so-called bacterial plaque and carbohydrates.

Bacterial plaque (dental plaque or microbial plaque) is a gray-yellow, thin film composed of colonies of bacteria growing in a fundamental substance rich in mucoproteins and polysaccharides. This thin film is firmly adherent to the adjacent material, be it enamel, tartar (dental calculus), or dental prosthesis. Carbohydrates, especially saccharose, have been observed to have an important role in the demineralization of the calcified component of the teeth. Anatomically, dental caries are classified as to the depth of disease as follows:

1. Superficial caries, involving the enamel
2. Intermediate caries, extending to the superficial layers of the dentin
3. Deep caries, involving the entire wall of the dentin

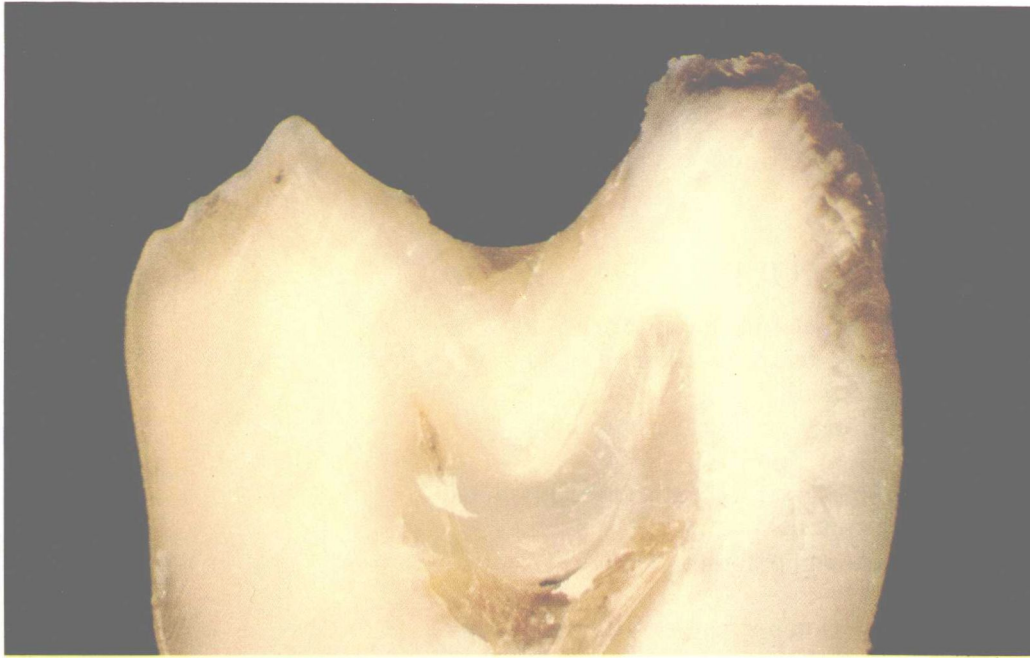
These are further divided into penetrating and nonpenetrating, reflecting the presence or absence of disease in the adjacent pulp.

Topographically dental caries have been described as:

- Pit or fissure caries
- Proximal caries
- Cervical caries
- Surface caries

Regarding the rate of evolution of disease, caries are classified as acute dental caries, "wet caries" with a rapid clinical course; and chronic dental caries, "dry caries," which progress slowly.

Fig. 1-1, A-E



1-1A



1-1B

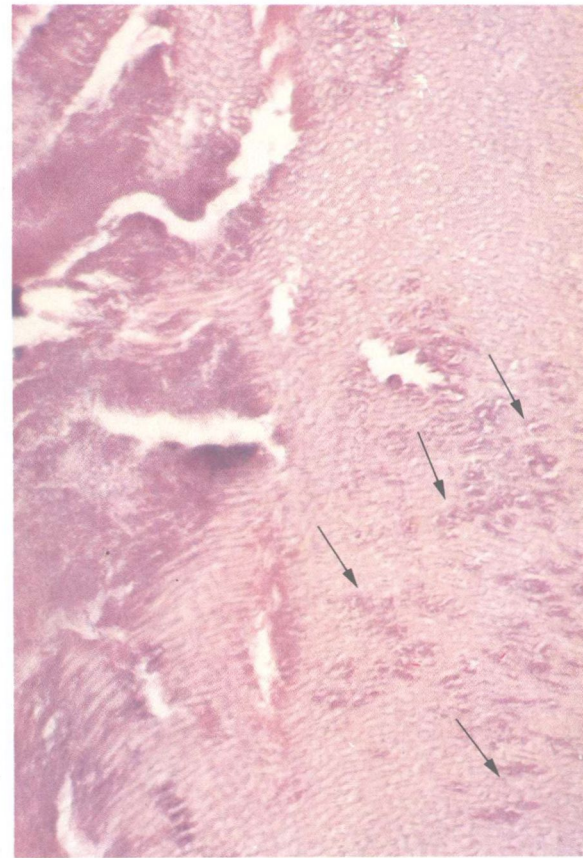
Fig. 1-1. Various types of dental caries involving **A**, occlusive surface; **B**, neck; and **C** and **D**, dental pulp. **E**, Histologic section of caries showing bacterial colonies (arrow) within the deep layers of the dentinal tubules. (H&E; $\times 40$.) (Courtesy Dr. M. Mlac.)



1-1C



1-1D



1-1E

PATHOLOGY OF THE DENTAL PULP

Disease in the dental pulp is related either to sequelae of dental caries—known as open pulpitis (*pulpitis aperta*)—or to clinical, toxic, or thermal agents and trauma—known as closed pulpitis (*pulpitis clausa*).

Pulpitis, regardless of the causative agent, may be acute or chronic.

Acute pulpitis is classified as follows:

1. Acute serous focal or superficial pulpitis (with edema and superficial infiltration of polymorphonuclear neutrophils)
2. Acute serous total pulpitis (with collection of polymorphonuclear neutrophils within the pulp)
3. Acute suppurative pulpitis (with liquefaction necrosis of the entire pulp)

Chronic pulpitis is subdivided into:

1. Ulcerative chronic pulpitis (with a wide-open exposure to the surface, with marked necrosis and ulceration)
2. Gangrenous chronic pulpitis (with putrefactive necrosis of the coronal pulp and chronic inflammatory changes of the radicular pulp)

Sequelae to chronic dental pulp infections are (1) progressive, with fibrous connective tissue proliferation, or (2) regressive, with atrophy, degeneration and necrosis.

Fig. 1-1, C, D

PERIODONTAL PATHOLOGY

Inflammatory and degenerative processes of the supportive structures of the teeth may involve the connective tissue and bone. In most cases there is co-existing disease of the dental pulp.

The periodontal diseases are divided in acute, which are of less morphologic significance, and chronic. Among the chronic diseases, the most common is the dental granuloma; this lesion can involve the tooth root (i.e., periapical granuloma) or rarely the lateroradicular surface of the tooth. This process is characterized by progressive reabsorption of the alveolar bone and cementum, surrounded by connective tissue proliferation. The "granuloma" appears as a red-gray, fleshy mass with smooth surface and varies in size from 0.5 to 1.5 cm. There are two types of dental granulomas:

Fig. 1-2, A, B

1. *Simple granuloma*. This is composed of hyperplastic connective tissue with vascularity of such prominence as to resemble a hemangioma.

2. *Epithelial granuloma*. This consists of sheets of proliferating epithelial cells that may arise from the epithelial rests of Malassez or from atypical proliferation of the oral epithelium. Eventually, the degeneration of these rests of epithelium will give rise to cystic granuloma, which is considered to be the initial stage of apical periodontal cyst (radicular cyst, periodontal cyst, root end cyst).

TUMORS

In this chapter we will briefly describe the tumors originating from odontogenic tissue and from the maxillary bone that have an anatomic and functional relation with the tooth and form a combined anatomic entity. Consequently, we are including those cystic structures that have an inflammatory or embryonic pathogenesis. We are following Bernier* classification based on the embryogenesis of the tissues.

Cysts

Ectodermal odontogenic cysts

Follicular cysts (dentigerous cysts). Dentigerous cysts originate from the epithelial remnants of the tooth follicle. They are frequently located in the superior maxilla and can penetrate into the maxillary sinus. The origin of the cysts appears to be traumatic, toxic, and infectious. Microscopically, follicular cysts have a fibrous wall that may be collagenous or loosely organized, depending on the age of the lesion. The lumen of the cyst is lined by stratified squamous epithelium. Grossly these cysts may have a smooth or an irregular mamelonated appearance. They are filled with a clear serous fluid with low cholesterol content. These cysts can become infected (less frequently than a radicular cyst) or undergo ameloblastomatous transformation of the odontogenic epithelium of the cystic wall.

*Bernier, J.L.: Tumor of odontogenic apparatus and jaws. In Atlas of tumor pathology, Washington, D.C., 1960, Armed Forces Institute of Pathology.

Radicular cysts. Radicular cysts result from chronic periodontal infection more frequently than follicular cysts do. They originate in dental granuloma as a result of proliferation of connective tissue and destruction of the alveolodental ligament. When the epithelial nest of tissue, originating from Hertwig's sheet, proliferates to form a central lumen, the term radicular cyst is applied. These cysts are more common in the mandible. The cystic wall is composed of two layers: the outer is dense fibrous connective tissue and the inner is stratified squamous epithelium. The lumen may contain clear, transparent, yellowish fluid or be filled with desquamated epithelium, red blood cells, inflammatory cells, and cholesterol crystals that sometimes form yellow-white bodies. The cystic contents may become infected; the resultant purulent cyst will have a soft wall and ulcerated epithelium. Radicular cysts may be classified according to their location and origin as follows: apical cysts, lateral or periodontal cysts, and residual radicular cysts (after extraction of the tooth).

Ectodermal nonodontogenic cysts

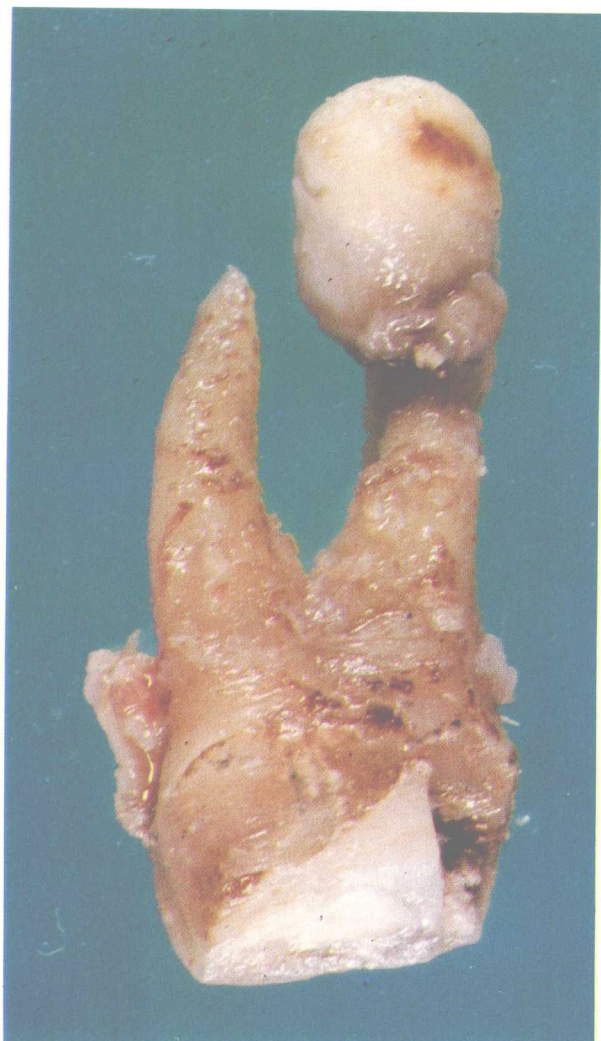
Nasopalatine cysts. Nasopalatine cysts arise from epithelial remnants of the nasopalatine ducts either near the alveolar process between the incisive roots or near the opening of the nasopalatine canal. They are called incisive canal cysts or cysts of the papilla palatina, respectively.

Globulomaxillary cysts. Globulomaxillary cysts arise from residual epithelium at the junction of the globular processes of the frontonasal bone with the adjacent maxillary processes of the palatine bones. These cysts are lined by stratified squamous or ciliated pseudostratified columnar epithelium. They are usually located between the root of the superior lateral incisor and the canine.

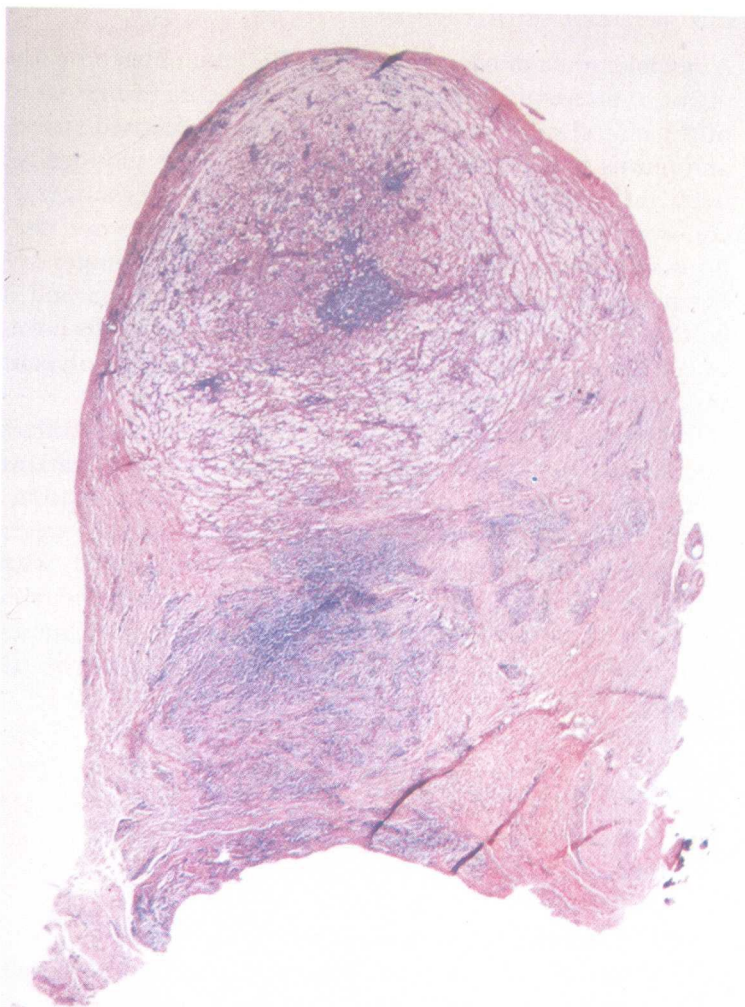
Nasoalveolar cysts. Nasoalveolar cysts are characteristically found near the base of the nostrils.

• • •

For completeness we should mention median fissural cysts, which can be subclassified as either median alveolar cysts and median palatal cysts; aneurysmal bone cysts; dermoid cysts; bronchial cleft cysts; and retention salivary cysts (ranula), which occur in the floor of the mouth in association with sublingual gland ducts.



1-2A



1-2B

Fig. 1-2. A, Apical granuloma; B, histologic section. (H&E; $\times 4$.)

Ectodermal odontogenic tumors

Ameloblastoma or adamantinoma. The ameloblastoma is a neoplasm of enamel organ-type tissue; according to some authors it originates from the basal layer of the buccal mucosa. It is most commonly located at the junction of the body and ramus of the mandible. It is slow growing and locally invasive. The tumor does not metastasize but frequently recurs after surgery. While the literature contains cases of malignant degeneration, these are not reliable. The tumor begins as a firm, white, solid mass but becomes progressively multilocular and cystic. Histologically there are interlacing strands and nests of odontogenic epithelium enmeshed in a mucoïd stroma. The cords have a peripheral palisade of columnar epithelium, an intermediate layer of polygonal cells, and an inner layer of fusiform and stellate cells.

When there is squamous metaplasia with keratinization, the term acanthomatous ameloblastoma is used. There are other variants of ameloblastoma: the hemangiomatous ameloblastoma, the spongiomatous ameloblastoma, the adenoameloblastoma (with arrangement of odontogenic epithelial cells into duct-like structures), and the melanoameloblastoma, with melanotic pigment within the cytoplasm of neoplastic cells. Although the rapidity of growth of this tumor may be disturbing, it does not become malignant. Rare cases of extra-mandibular ameloblastoma have been reported in the tibia, ulna, fibula, and femur.

Mesodermal odontogenic tumors

These tumors are very rare and will be only listed:

- Myxoma
- Fibroma
- Dentinoma: a calcified mesenchymal tumor
- Cementoma: calcified material is found in the periapical region lying separated from the root of the tooth
- Cementifying fibroma: formed by isolated masses of cementum, this lesion often resembles fibrous dysplasia in the jaws or ossifying fibroma

Mixed (ectodermal and mesodermal) odontogenic tumors

These tumors are a combination of the previously described neoplasms:

- Ameloblastic fibroma
- Ameloblastic hemangioma and neurilemmoma
- Ameloblastic odontoma
- Odontoma