PERIPHERAL TUMORS OF THE JAWS

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The word tumor has been defined as any swelling or morbid enlargement. A tumor is a phase of an inflammatory process and it is used to describe neoplasms or blastomata. These tissue masses occurring within the buccal cavity should be of particular interest to members of the dental profession because they are often the first to be consulted by the patient. This paper will be limited to the discussion of tumors located on the peripheral tissues and commonly known as epuli. The large group of centrally located tumors which, in the course of time may involve the peripheral tissues, will not be considered.

The common tumors of the peripheral tissues of the buccal cavity are inflammatory in origin. Infections such as actinomycosis, tuberculosis, and syphilis which are known as the granulomatous diseases may be characterized by tumor or swelling of the peripheral tissues of the mouth. The possibility of their presence should be considered in the differential diagnosis of all oral lesions.

Undoubtedly, the most common peripheral tumor of the jaws is the simple hypertrophy or tumor-like overgrowth which is known as the epulis granulomatosa or granuloma pyogenicum. These simple tumors exhibit characteristics of both true inflammation and true blastoma. They may occur anywhere in the mouth but they are found most frequently on the marginal gingiva. They vary in size and may have normal epithelial covering. They may occur in the socket of a recently extracted tooth where a foreign body, a tooth fragment, or usually a small bony sequestrum is found to be the underlying cause. It is generally believed that mechanical irritation is an important pathogenic factor, such as from carious teeth, poor fillings that overhang, poorly adapted dentures, and excessive calculi. For this reason they are most often found in those mouths where oral neglect is much in evidence. These epuli appear to be closely related to the fibromata and they may recur after incomplete removal.

Examination microscopically reveals hyperplasia of connective tissue with evidence of chronic inflammation and hypertrophy of the overlying epithelium. The so-called gum boil which is the peripheral terminus of the sinus tract from a periapical abscess belongs in this group as do also the so-called pregnancy tumors of the gingiva which are associated with altered endocrine function. An extenuation of this condition, usually occurring in adolescence and characterized by generalized hypertrophy of the gingiva, has been described by Prinz and Greenbaum[1] under the tile of "Diffuse Fibromatosis of the Gingiva." The etiology of this condition is unknown. It is characterized, in addition to the

marked gingival hypertrophy, by a loosening and displacement of the teeth, with gradual resorption of the underlying alveolar bone.

Benign giant-cell tumors which may occur peripherally as well as centrally are believed by Geschickter and Copeland[2] to constitute an earlier stage of the peripheral fibroma. This tumor, as the name implies, is characterized histologically by foreign body giant-cells, with centrally located nuclei in a fibrous stroma. It has been pointed out that in the mouth they have a predilection for parts of precartilagenous origin or anterior to the molar teeth at the site of those deciduous teeth which are shed through osteoclastic reaction on their roots. Their etiology is uncertain, but some irritating factor is usually present. Ewing[3] and Bloodgood[4] believe the tumor is a true blastoma while others support the inflammatory or reparative theory as advanced by Geschickter and Copeland. The clinical picture is that of a dark red to purplish swelling, firmly attached to the bone. Moderately indurated, it is not fluctuant, and it may, over a period of time, erode the alveolar bone so as to produce roentgenographically an area of bone destruction through which may be observed coarse trabeculations. A walling-off zone of condensing osteitis may be observed attempting to limit the progress of the erosion.

The benign peripheral fibroma belongs in the group of true blastomata. These tumors are well defined and slow growing, occurring anywhere on the investing tissues of the mouth. They are characterized clinically by nodular masses of tissue covered with normal epithelium. They may be hard, soft, or of a mixed type. The histological picture is that of pink staining bundles of collagen fibers, loosely arranged in the soft type to dense interlacing bundles of the hard type with slight vascularity. Round-cell infiltration, characterizing inflammatory reaction, is never pronounced but may frequently be observed in some part of the section.

The malignant fibroblastoma or fibrosarcoma may occur on the investing tissues of the buccal mucosa. Early growth may be slow with a rapid change as a later manifestation. Clinically, it appears as a deep red to bluish-red mass of hard, elastic character, developing on a broad base. It is quite vascular and bleeds freely on injury. The alveolar process of either the maxilla or mandible, often in the region of the ramus, is the most frequent site. Histologically, it is a very cellular tumor with spindle-type cells, fairly uniform in size, with a dense cytoplasm and deep staining nuclei showing frequent mitotic figures. The fibrous stroma identifies this type from the osteogenic type which, while originating centrally, may involve the peripheral tissues. Thoma[5] has stated that it does not appear to be as common today as compared with two or three decades ago and he believes this is probably due to more

careful differentiation and diagnosis, giant-cell tumors having been classified as sarcomas in the past.

There are a few other true tumors or blastomata which occasionally, although exceedingly rarely, occur on the peripheral surface of the jaws. One of these is the myxoma of mesenchymal origin, with cells developed to produce mucin, lipoma composed of fat cells and with a gross appearance of a yellow elastic mass, and the neuroma, with nerve cells. The true neuroma is one of the rarest of tumors that can occur in this region and must contain actual nerve cells or neurocytes. The term is often used in association with amputation neuroma which is not in the true sense a neuroma as it is a product of inflammatory fibrous tissue of the neurolemma, or sheath, which contains no nerve cells.

The endothelioma is another rare blastoma of the peripheral tissues, usually occurring on the palate at the junction of the hard and soft palate to the lateral aspect. It forms a spherical, circumscribed mass, with normal epithelial covering. The cells of this tumor are derived from the mesenchyma and are closely related to connective tissue which gives a varied histological appearance, making microscopic diagnosis most difficult.

The angioblastoma may be made up of blood vessels as in the hemangioma or lymph vessels as in the lymphangioma. The hemangioma, of which there are several recognized types, occurs in the region of the embryonic fissures on the skin, lips, nose, and mucous membranes of the mouth. In the mouth it may be said to occur most frequently on the papillae between the teeth. These tumors have a soft, spongy, vascular, rounded appearance, ranging in color from red to deepest purple, depending upon size and type of blood. The lymphangioma is usually found on the lip or tongue, occurring as a congenital formation.

The lymphoblastoma, or tumor whose cells belong to the lymphocytic series, are slow growing and often are mistaken for chronic inflammatory processes. This tumor is known under a variety of names such as the lymphocytoma, lymphoma, lymphosarcoma, small cell sarcoma, lymphatic leukemia, or Hodgkin's disease. The wide variation of names is due to the varied clinical pictures, according to location, rapidity of growth, and manner of spreading. Thoma[5] records a case of a lymphosarcoma of the gingival tissue in a patient, a man 66 years of age, who complained of swollen gums. On examination the gingival tissue which was generally inflamed revealed a small tumor mass under a bridge on the lower right side. The impression was hypertrophy due to mechanical irritation. Biopsy revealed a lymphosarcoma. New tissue rapidly developed on the gingival tissue with swelling of the submaxillary and submental glands. In spite of roentgen treatment, the patient's condition rapidly became worse with expiration four weeks after biopsy. Several

cases of leukemia treated at the Clinic have shown extensive hypertrophy on the gingival tissues and, while not confirmed by biopsy, appeared undoubtedly of lymphoblastic etiology. Gross oral neglect appears to be a definite predisposing factor.

The melanoblastoma is a tumor of mesenchymal origin and is extremely rare in the oral cavity. It is usually flat, covering a wide base and it is conspicuous chiefly because of its color which ranges from dark brown to black. It grows rapidly with metastasis early, treatment being of little avail. The tumor is found chiefly on the hard palate and, according to Thoma, the gingiva of the maxillary alveolar process. This lesion should not be confused with so-called blue gum which is frequently found on the alveolar tissue in members of the colored race.

Mixed tumors of the palate have been reported[6]. In these, tumor development occurs in at least two germinal derivatives, producing a combination of two neoplastic developments in one tumor. Teratoma, or tumors of tissue and organs of one, two or three germinal layers, may be found in the oral cavity on the palate, jaws, floor of the mouth, and tongue.

The papilloma is the benign, epithelial tumor which is frequently found on the soft tissues of the oral mucosa. These appear as pedunculated masses of soft, pale, cauliflower-like growths occurring on the cheeks or tongue as a rule. At microscopic examination, the marked keratinization which is readily seen is somewhat characteristic of this type of tumor. Epithelial proliferation marked by irregular epithelial downgrowths into the papillae of the corium or true skin is characteristic. This lesion is considered as a possible forerunner of its malignant relative the carcinoma.

Carcinoma of the oral structures in comparison with other oral abnormalities appears as an all too frequent occurrence.[7] The annual mortality rate from cancer in the United States has been given as approximately 90,000 of which some 3,000 growths were within the oral cavity. If there is to be any control whatever, predisposing factors must be eliminated. It does not seem to be mere coincidence that most carcinomas of the oral structures occur in those mouths where, due to oral neglect, oral sepsis is permitted to run rampant. This is a recognized predisposing factor which has been emphasized repeatedly. Other precancerous lesions of particular significance are in addition to the papilloma persistent cracks and fissures, smokers' burns, senile keratosis, and leukoplakia. Leukoplakia with cracks and fissures are to be regarded as the incipient stage of malignancy. Induration and fixation of the base with evidence of rapid change in any of these longstanding precancerous lesions have been pointed out so often that they are now considered axiomatic clinical evidence of malignancy.

It is not the purpose of this paper to discuss the details of the many pathological aspects of this disease. In the clinical manifestations, pain seems to be an early symptom. A fixed area of induration on palpation is always found. Ulcerations, if present, have a dirty grayish base with piled-up indurated edges. The adjacent lymph glands are involved early with ultimate perforation and ulceration of the skin. Metastasis to organs below the clavicle is relatively infrequent. The roentgen ray is of positive value in ascertaining involvement of adjacent bones but of little value apparently in treatment. The erosion of the peripheral bone is usually visible in the early stages; it can also be misleading, however, as Thoma has pointed out, and great care must be taken in forming conclusions as to the amount of bone involved as shown by the radiogram. The marrow spaces of the spongiosa of the bone may be infiltrated by the growth without changing the radiobility to any great extent. The ultimate outlook after the diagnosis has been confirmed by histolopathological study is grave. The use of radium or radon seeds in close proximity to bone produces a slowly healing osteomyelitis of the clinical sclerosing type accompanied by intense pain as has been pointed out. Hemorrhages must be expected as the vessels of the buccal mucosa are eroded. As the resistance of the patient decreases from anorexia, loss of blood, and mounting cachexia, secondary infection with osteomyelitis is a complicating factor. Termination of the disease occurs within one to one and one-half years with rising cachexia, suffocation, and pneumonia as common causes of death.

The following cases represent a few of the oral tumors most frequently observed by the Dental Department during the last year.

Case 1: A 66-year-old white woman complained that a growth in the mouth had been present for one month. She stated that she had noticed a small area on the left side of the upper gingiva toward the cheek which bled when she brushed her teeth. No pain had been experienced. One month previous to our examination she first noticed a small lump with redness and a little soreness but no pain in this area.

Oral examination revealed a mass in the upper left second molar area on the crest of the ridge into the buccal aspect about 2 cm. in diameter. It was spherical in shape on a broad base and had a reddish color with a sharp line of demarcation from the surrounding oral mucosa. It appeared somewhat indurated and movable, the overlying membrane was thinner than normal mucous membrane, and the mass was clear to transillumination. A roentgenogram revealed slight erosion of the alveolar bone.

Impression: (1) fibroma, (2) possible peripheral giant-cell tumor.

The mass was removed under local anesthesia, using the loop cautery followed by electrocoagulation to the base.

The pathological report was: "Section of tissue from the jaws shows a superficial ulceration with complete loss of mucosa in a wide zone of granulation tissue which formed the base of the ulcer. There is a thick layer of edematous connective tissue which is diffusely infiltrated by inflammatory cells of various types. There is no evidence of neoplasm of any kind. Sections of numerous small fragments of curettings from the jaw show cancellous bone with fibrous marrow, large areas of dense fibrous tissue, with chronic inflammatory reaction but no evidence of tumor."

Diagnosis: Chronic inflammatory tissue of the jaw (epulis granulomatosa).

Case 2: A woman, 44 years of age, complained of a swelling in the upper jaw. This swelling had been present in the upper left cuspid region of the maxilla for seven or eight weeks. Pain was first noticed about six months previously. The patient consulted her dentist who at that time found only slight swelling. Four months later the present lesion was observed. It had increased slightly in size but had not been associated with pain. About two weeks previous to the time the patient came to the Clinic the area was opened and bone spiculae were removed but no apparent improvement resulted.

Oral examination revealed a deep purplish-red, palpable, slightly suppurative swelling with some induration. Located in the upper left cuspid region, the mass was approximately 2.5 cm. in diameter. A radiogram the patient brought with her revealed markedly eroded bone with gross trabeculations, but these were not visible on the radiograms taken at our examination. There was a marked condensing osteitis at the inner margin of the eroded bone.

Under avertin anesthesia, the mass was removed by scalpel and the base thoroughly treated by electrocoagulation. Healing was uneventful, without pain or bleeding. Subsequent report six months later revealed normal healing and no recurrence. The patient is now wearing an upper denture with comfort.

Pathological report: "Section shows mucosal epithelium on one surface with a small area of ulceration. In the deeper tissues there is a very cellular, highly vascularized stroma with many multi-nucleated giant-cells present. There are also areas of young cancellous bone."

Diagnosis: Benign giant-cell epulis.

Case 3: A woman, 28 years of age, had marked oral neglect and a mass of soft tissue in the lower jaw between the left cuspid and lateral incisor. This patient was an extremely hysterical woman who had had palsy of the right side of the face since the age of eleven years and she had had frequent attacks of globus hystericus. Because multiple ex-

tractions were necessary, she had been referred to the Clinic. The patient stated that this mass of tissue had been present for approximately 6 to 7 months, apparently growing slowly.

At examination the mass appeared as a hard, immovable, localized hypertrophy of the gingiva between the lower left cuspid and lateral incisor, forcing these teeth apart. A radiogram of the area showed no abnormality. This mass appeared to be attached by a broad base to the buccal aspect of the soft tissue.

Under avertin anesthesia the mass was removed with scalpel, followed by electrocoagulation to the base of the area. The lower impacted third molar on the right side was removed at the same time.

Pathological report: "Section of gingival mucosa partially covered by stratified squamous epithelium with an area of ulceration and complete loss of epithelium and marked inflammatory reaction and considerable fibrosis of the submucosal tissues."

Diagnosis: Chronic inflammatory tissue of the jaw.

Note: Comparison of the histopathological picture of this tissue with that of the first case impresses one with the increased amount of fibrosis present in this tissue. Thus it appears to be a possible transitional stage from chronic inflammatory tissue epulis to a true fibroma.

Case 4: A school girl, 12 years and 10 months old, complained of marked overgrowth of the gingival tissues. This patient was in the seventh grade of school and was making excellent grades. The condition of her mouth had been normal until the age of six years when, on loss of the deciduous teeth, a gradual overgrowth of the gums began. The greatest growth had been noted during the preceding year. No pain had been associated with this generalized hypertrophy.

Examination revealed a generalized marked overgrowth of the gingival tissues, in some instances completely covering the permanent teeth which were loose and malposed. The tissue was characterized by deep pockets or crypts lying along the adjacent teeth. The crypts appeared very tender and smears taken for culture of Vincent's organisms were strongly positive.

The physical examination was essentially negative. Roentgen findings, however, revealed the epiphyseal bone age to be 14 to 15 years and there was marked absorption of the alveolar bones of the jaws. The patient had previously consulted an oral surgeon whose report of a biopsy was: "The pathological process is a hypertrophy of the connective tissue associated with marked edema. It cannot be considered the result of some local infection, the pathological picture is not at all that of a lymphoblastoma." Following the advice of their family physician, the parents did not wish any surgery performed at this time. Accord-

ingly, local treatment to the gingival tissue, using well-known medicaments for the treatment of Vincent's infection and roentgen therapy to the mouth in doses of approximately 1000 R units over a period of four months resulted in no apparent improvement in the condition.

Diagnosis: Diffuse fibromatosis of the gingiva (Prinz and Greenbaum).

Case 5: A business man, aged 75 years, complained of an ulcerating lesion of the soft tissue located in the midline of the maxilla. The patient had first noticed a canker sore on the upper gum with a swelling of the lip twenty-three days previous to our examination. At this time he went to a dentist who checked the teeth and found them essentially negative so he referred the patient to a physician. The physician first took a biopsy which was not reported and treated the patient for trench mouth until a second biopsy was reported as round cell carcinoma. Roentgen treatments were then administered. This was 6 days prior to the patient's entry to the Clinic.

Examination revealed a lesion in the upper maxilla at the midline at the junction of the lip and gum and involving both. This ulcerated lesion was about the size of a nickel with a rather dirty base with indurated edges. The oral condition appeared rather poor with some evidence of oral neglect. Radiograms of the teeth revealed some devitalized teeth showing periapical involvement. The patient had been wearing a dental appliance in the upper anterior part of the mouth. The patient does not smoke.

Under avertin anesthesia, the area was thoroughly cauterized, using electrocoagulation after biopsy.

Pathological report: "Section shows an infiltrating squamous cell carcinoma composed of small nests of epithelial cells with very little tendency to form kerato-hyaline material or pearls. There is a great deal of rather dense stroma in which there is a diffuse inflammatory reaction."

Diagnosis: Squamous cell carcinoma.

Two years later, there was a recurrence with metastasis to the right submaxillary gland. Subsequent roentgen treatment to this area resulted in marked tissue reaction with extensive hemorrhage. On recovery, further electrocoagulation to the area in the mouth was performed. This has been followed by an apparent osteomyelitis with subsequent swelling in the left submaxillary area and formation of an abscess.

Case 6: A man, 66 years of age, complained of a lesion of the mouth. He gave the following history. About five weeks previously he noticed a roughening of the mucosa on the left lower jaw. He had been wearing a lower denture for a period of time but the denture needed adjustments

so he had made these by smoothing the area with sandpaper. The lesion had not increased in size since it was first noted.

Examination revealed a mouth completely edentulous with a raised nodular growth extending along the mandible for about three to four centimeters in the bicuspid region in the floor of the mouth. There was evidence of indurated, infiltrating tissues with an ulcerated crest. A biopsy from this area was reported as follows: "Section of mucosal tissue from the jaw showed an infiltrating, fairly well differentiated, pearl-forming, squamous cell carcinomatous type of growth."

Diagnosis: Squamous cell carcinoma of the jaw.

A total of 3900 roentgen units were given over a period of 18 days. Under this treatment there appeared to be some improvement in the lesion. Six months later, however, the patient again began to have pain and there was noticed a firm mass on the lingual mucosa which was flat and fairly movable with no ulceration. Three months later radon seeds were implanted in the floor of the mouth. Two months later further radon seeds were implanted in the floor of the mouth in the indurated areas. The patient was having considerable pain. He was unable to sleep at night, and considerable necrotic foul tissue was present. One year later the area below the left mandible broke down with a discharge of pus. There was, however, some relief in the pain with marked difficulty in swallowing. There has been a gradual loss in weight.

Case 7: A farmer, 60 years of age, complained chiefly of a sore in the cheek. This patient had been wearing an upper denture for 20 years and a lower denture for 5 years. In the preceding several months he had noticed some temporary intermittent soreness of the left cheek opposite the molar teeth of the denture, but this had not lasted more than 24 hours at a time. Three months previously he noticed a painful sore at this site which made it impossible for him to wear the denture or masticate food. A small kernel in the left submaxillary region had been present for five years but this had enlarged in the past three months and become painful and tender. This patient had chewed tobacco for many years.

Examination revealed in the left side of the mouth opposite the molar teeth an indurated, roughened lesion about the size of a dollar. It was quite tender and arose from the alveolar process in this area. There was a nodule the size of a hazelnut in the left submaxillary region which was tender and fixed.

Diagnosis: Carcinoma of the mouth with glandular metastasis.

Treatment: Under avertin anesthesia the area was treated by electrocoagulation. The postoperative sequence included several secondary hemorrhages but two months later the area appeared well healed with

no evidence of neoplasm. However, four months after operation, examination revealed recurrence. Operation was again performed, using electrocoagulation with implantation of radon seeds to the skin below the mandible. A pathological fracture occurred at this time due to the extension of the growth in the osseous structure. No pathological report was made and the diagnosis has been based principally on clinical examination.

Summary

The importance of oral health as a vital part of general health is to be emphasized. Innocent oral lesions should not be regarded lightly; they warrant early and complete removal with elimination of etiological factors. Too much stress should not be placed on the condition known as Vincent's infection with disregard for a careful search for underlying factors.

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