LECTURES ON CERTAIN DISEASES OF THE JAWS.

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LECTURE II.—TUMOURS OF THE JAWS.

MR. PRESIDENT AND GENTLEMEN,—In my last lecture I discussed the cystic affections of the jaws, and referred, among others, to the dentigerous cyst due to a misplaced tooth. It does not, however, require the development of a cyst to render a misplaced tooth important, for there are many recorded instances in which mere displacement of a tooth from its normal position has given rise to deformity and the suspicion of grave disease.

Even more remarkable, however, than mere malposition are certain modifications which the molar teeth occasionally undergo during their development, giving rise to most interesting tumours of the jaw, which have been specially studied and described under the name *Odontomes* by Broca. These tumours depend upon some modification of the germ of the tooth before the formation of the cap of dentine, and belong to Broca's second class, *odontomes odonto-plastiques* or *odontomes bulbaires*. The result is the formation of an irregular mass of dental tissues in no way resembling a tooth in shape.

There are, I believe, but nine cases of this form of odontoma recorded, and these all occurred in the lower jaw. The first case was communicated to the Faculty of Medicine of Paris in 1809 by M. Oudet. The patient, a man aged 25, had on the right side of the lower jaw a mass occupying the position of the premolar teeth, which on removal proved to be composed of dentine and enamel. A similar mass on the left side was not removed. The second case occurred some years back, in the practice of Sir William Fergusson, by whom the tumour was removed with a portion of the jaw, and is described by Sir J. Tomes, from whose work a drawing of a section of the tumour is taken (Fig. 1). The second molar of the lower jaw was represented

Fig. 1.

by an irregularly flattened mass, composed of enamel, dentine, and bone, derived from calcification of remnants of the dentine pulp, thrown together without any definite arrangement, by which the wisdom tooth was held down. The dental mass, when removed from its receptacle in the bone, presented no resemblance to a tooth. Little beads of enamel here and there projected from the surface, which was generally rough and irregular. The naked-eye appearance of the section is accurately given in the woodcut, the radiate character in which shows the arrangement of the component tissues, which, by the aid of the microscope, are seen at places to alternate. The alternation is mainly effected by the dentine and bony tissue, and these, indeed, form the great bulk of the mass. The appearances presented, prior to the operation, consisted in enlargement of the jaw posterior to the first permanent molar tooth, with a hard, brown-looking body projecting but slightly from the surface of the gum. This projecting portion was, in fact, the upper surface of the aberrant tooth; and the nodules of enamel were, for the most part, situated in this part of the mass.

The third case occurred to Dr. Forget in the person of a young man, aged 20, who presented himself in 1855 with a disease of the [1382]

lower jaw, from which he had suffered since he was 5 years old. Upon looking into the mouth, a round, smooth tumour, hard and unyielding, was seen occupying nearly the whole of the left side of the jaw. None of the teeth beyond the first bicuspid were present. Dr. Forget removed the portion of the jaw involved by sawing through it in front of the bicuspid tooth, and also through the ramus at the level of the inferior dental foramen. The portion removed is seen in the accompanying drawing (Fig. 2). An examination of the portion which had

been removed showed that the jaw between the ramus and the first bicuspid tooth was converted into a cavity, which was occupied by a hard oval mass, of the size of an egg, having an uneven surface covered here and there with minute tubercles, which were invested by a layer of enamel, penetrating into the substance of the bone, and easily recognisable by its shining appearance and peculiar colour. A section of the tumour showed that it consisted of a compact tissue of the consistence of ivory, of a greyish-white colour, in the interior of which it was possible to perceive, with the naked eye, a kind of regular arrangement of the elements which entered into its composition. Between the tumour and the osseous cyst was a thick membrane, apparently of a fibro-cellular structure. At the anterior extremity of the base of the tumour was a depression in which the crown of an inverted molar tooth was wedged in between it and the maxilla. This tooth is seen in Fig. 2, c, where a portion of bone has been cut away; a and b mark portions of the tumour projecting through the jaw, and d is the second bicuspid tooth lying below the first, e.

The microscopic examination of the tumour showed it to be composed principally of dentine, with enamel on the surface and dipping into the crevices, at the bottom of which, as well as in other parts, portions of cementum were found.

The fourth case of the kind was brought under the notice of the Odontological Society of Great Britain, in December, 1862, by the late Mr. W. A. Harrison, F.R.C.S. The specimen closely resembled those already described, and came from the left side of the lower jaw of a lunatic, where it occupied the space between the incisor and molar teeth. It came away spontaneously, leaving a long deep groove, large enough to receive the last joint of the thumb, which soon granulated and contracted.

The fifth case is given in Heider and Wedl's *Atlas zur Pathologie der Zähne*, and closely resembles Sir J. Tomes's case, the second molar tooth of the right side being developed into a large irregular mass, and holding down the wisdom tooth. It was easily removed.

Mr. Annandale has reported a sixth case, occurring in the lower jaw of a young woman, aged 17, who had never had any molar teeth on the left side. A nodulated mass, which somewhat resembled a piece of necrosed bone, projected above the gum, and was firmly fixed. Mr. Annandale dislodged the growth, and removed it through the mouth. It measured an inch and a half by an inch and a quarter, and weighed 300 grains, and on section showed that a cap of enamel, varying in thickness, was arranged over a portion of the irregular surface of the mass. Beneath this, well-formed dentine, forming a considerable thickness, was met with, and still deeper in the substance of the mass, true bone, containing lacunæ, canaliculi, and Haversian canals, was seen to be intermingled in a confused manner with portions of dentine, so as to form the substance called by histologists "osteo-dentine."

The seventh case occurred in the practice of Dr. Goodwillie, of

New York, and is mentioned in Agnew's *Surgery*, vol. ii. It appears to have been removed with the angle of the jaw.

An eighth case has been recorded by myself in the *Clinical Society's*

Fig. 3.

Fig. 4.

Transactions, vol. xv. The mass measured an inch and a quarter antero-posteriorly, an inch transversely, and an inch and a half from above downwards. It weighed 315 grains, and is shown in Figs. 3 and 4.

Dr. Arkovy, of Buda Pesth, has recently recorded a ninth example, closely resembling the foregoing. All these specimens were met with in young adults, and only the first, fifth, sixth, eighth, and ninth were extracted from the jaw by the surgeon; in Mr. Harrison's case the mass coming away spontaneously, and in Mr. Tomes's and M. Forget's cases a considerable portion of the lower jaw being removed by such experienced surgeons as Sir William Fergusson and M. Maisonneuve. In my own case I must confess that I did not appreciate at first the nature of the tumour, and recommended the removal of a portion of the jaw, and it was only during a subsequent operation, undertaken for supposed necrosis, that the true nature of the case became apparent.

A *fibrous epulis*, if allowed to grow to a large size, will produce external deformity of the face, and although attached to the upper jaw, may hang down so as to simulate disease of the lower jaw. This was well seen in a woman aged 27, who had an epulis of the upper jaw of seven years' growth, which hung down to the level of the angle of the jaw, and who was under the care of Mr. Erichsen, by whom the tumour was removed in 1861, with perfect success. Perhaps the most remarkable case of epuloid growth on record, however, is Mr. Liston's well-known patient, Mary Griffiths, from whom, in October 1836, he removed the growth shown in the accompanying drawing, Fig. 5.

The patient had laboured under the disease for eight years, and had been subjected to a partial removal of the growth when of considerable size. The tumour was of a simple fibrous structure. The growth sprang originally from the gums and sockets of the incisors and canine tooth of the left side; at an early period it protruded from the mouth, unconfined and uninfluenced by the pressure of the lips or cheek. It had assumed a most formidable size and appearance, concealed the palate and pharynx, and gave rise to great

inconvenience and continued suffering. The surface had been broken by ulceration, but upon a close inspection of the projecting part and of that covered by the cheek, it was found to possess a firm consistence, and to present the same peculiar botryoidal arrangement of its parts as the others of a simple and benign nature. The operation proved perfectly successful. The preparation is in the Museum of the College of Surgeons (2193).

A case very similar in many respects to the preceding one was successfully operated upon in 1869 by Professor Kinloch, of Charleston. The patient was a negress, aged 25, and presented much the appearance shown in Fig. 5, the mouth being enormously distended by a protruding growth, which appeared to have originated in the alveolus, but to have involved the superior maxilla. Dr. Kinloch removed the whole mass, which weighed nearly two pounds, and the patient made a good recovery.

Fibroma of the lower jaw closely resembles the fibrous tumours of other parts of the body, and especially in connection with the uterus. It is dense in structure, but not unfrequently lobulated, and, on section, slender bundles of intersecting fibres may occasionally be traced in it, of which there are good examples in the Museum of the College of Surgeons. The fibrous tumour usually springs from one of two situations, either the interior of the antrum or from some portion of the alveolus. In both cases it is intimately connected with the periosteum, in this respect resembling epulis. Occasionally the growth appears to follow some slight injury, as in the case of a lady, a patient of Dr. Neale, from whom, in 1870, I successfully removed a fibrous tumour occupying the interior of the antrum, which had followed a blow given by her child, and which may have been a fibrous odontoma. The fibrous tumour grows slowly, but surely, involving in its progress the surrounding structures. When arising in the antrum, it first expands the walls of that cavity, bulging out the face and forming tumours in the palate and floor of the orbit, and subsequently produces absorption of the osseous walls, and spreads unchecked in all directions. (See St. George's Hospital Museum, II, 160.)

When it arises from the alveolus, a fibrous tumour may encroach on both the facial and the palatine surfaces of the jaw, crushing in the antrum, although not involving its interior. Of this a good example is seen in a preparation (2238) in the College of Surgeons, of an upper jaw removed by Mr. Liston. Here the tumour, which is affixed to the alveolar border near the molar teeth, extends inwards so as to cover the palatine portion of the jaw, and outwards so as to conceal all the bicuspid and molar teeth, with the exception of the last. The walls of the antrum are pressed inwards, but its interior is healthy. The patient was a woman, thirty years old; and the tumour was observed four years before its removal, which was successful. On the other

Fig. 6.

hand, fibrous tumours, though commencing in the alveolus, may secondarily involve the antrum when they have attained considerable size, producing complete absorption of its walls, and projecting into the nose and through the palate. Of this a preparation in the College of Surgeons' Museum (2236) of an upper jaw, also removed by Mr. Liston, affords a good example. Here the patient was only 21, and the growth first appeared on the outer side of the gum of the left upper jaw four years before the operation. It was cut off six months

after its first appearance, but returned, and eighteen months after was removed, with a portion of the alveolar process, but reappeared in a few weeks. Fig. 6, from Liston's *Practical Surgery*, shows the patient before the operation. It may be noticed here, as in the case of a large epulis, that disease of the upper jaw often resembles, externally, a tumour of the inferior maxilla.

The enormous size to which fibrous tumours of the upper jaw may grow without destroying the patient is well seen in the accompanying drawing (Fig. 7) of Mr. Liston's celebrated case of Mrs. Frazer, from

Fig. 7.

whom that eminent surgeon successfully removed the growth. The tumour is preserved in the Museum of the College of Surgeons (2241), and its diameters are, vertically, 7 inches; transversely, 7 inches; from before backwards, nearly 6 inches. Contrary to the ordinary practice, a portion of the integument was removed with the tumour, measuring 12 inches in length and 10 in breadth, and this left a gap in the skin of the face upon the patient's recovery. The growth of this tumour was connected apparently in a curious way with the performance of the uterine functions. The patient was 40 years old, and the tumour began to grow six years before its removal, in consequence of a blow in the region of the antrum. Its progress at first was slow and not painful, but at the end of two years a distinct tumour was felt in the cheek. During the next two years it grew rapidly, especially during a period of gestation, but still without much pain. In the fifth year of its growth she bore a second child, after which the catamenia ceased to flow, and the tumour was subject to monthly augmentations of its vascularity, and slight hæmorrhages occurred from its inner, though not ulcerated, surface, and from the adjacent parts of the gum.

A remarkable feature, noticed in a case of fibrous tumour of the antrum, in a young man aged 18, under the care of Sir J. Paget in 1860, was a distinct pulsation in a portion of the tumour which projected into the orbit. The pulsation was slight but decided, and was synchronous with the radial pulse. The case was clearly not one of malignant disease, but proved to be an ordinary fibrous tumour upon removal. No satisfactory explanation seems possible of the case, which I believe to be unique. Suppuration has occurred in connection with fibrous tumours of the jaw, but only, I believe, when they have been punctured with a view to exploration and diagnosis. Of this the tumour removed from Janet Campbell, and preserved in the Museum of the College of Surgeons (2239) is an example. Simple fibrous tumours occasionally recur after removal, but it is doubtful whether in these cases the whole of the disease has been eradicated. According to O. Weber, they are usually connected with the lining of the Haversian canals of the surrounding bone, and though he believes that these processes may sometimes be effectually detached, he advises the practice ordinarily followed of removing a portion of the bone.

Fibrous tumours of the jaw, like those in other parts of the body, and especially in the uterus, are liable to calcareous degeneration, or, as is sometimes incorrectly stated, to ossific deposit. A good specimen of the kind is preserved in the Museum of St. Thomas's Hospital

(I. 18). A thin section of this tumour has been dried and preserved, in order to show the amount and distribution of the calcareous matter (I. 19).

A remarkable example of calcareous degeneration of a fibrous tumour occurred in the practice of Sir W. Fergusson, and the preparation is now in the Museum of the College of Surgeons (2242). It is a fibrous tumour of the left upper jaw, of some years' growth, from a woman aged 50, containing numerous calcareous particles and acicular crystals, and, in addition, enclosing a suppurating cavity, in which was a mass about an inch in diameter, found by Dr. Goodhart to consist of acicular crystals of mineral matter, entangling in places nucleated and shrivelled cells. This is clearly an example of extreme calcareous degeneration undergoing necrosis.

Fibrous tumour is the commonest form of growth in the lower jaw, and, as pointed out by Paget, this may take the endosteal or periosteal form. The formation of fibrous tumours between the plates of

Fig. 8.

the lower jaw originates, I believe, in the majority of cases in some inflammatory deposit due to the irritation of decayed teeth. By the slow growth of the tumour the jaw is expanded, the outer plate yielding more readily than the inner, as is well seen in a preparation in University College Museum (Fig. 8), which also shows a curious transportation of the wisdom tooth close up to the condyle of the jaw by the growth of the tumour, being probably connected with it in some way. In the College of Surgeons' Museum (2219) is a good specimen of endosteal fibrous tumour, which Sir Spencer Wells removed with the jaw from the symphysis to the angle, in a woman aged 27. The tumour occupied the left side of the lower jaw, and had existed for four years, being connected with decayed teeth, one of which on being extracted shortly before the operation brought a small portion of the tumour away with it.

It may, I think, be doubted whether a milder treatment than that of removal of the whole thickness of the bone containing tumours of this description might not sometimes be adopted with advantage. A specimen in the Museum of King's College, which is represented in Fig. 9, admirably illustrates this view. It is a fibrous tumour, removed, when I happened to be present, by Sir William Fergusson, from a woman who had undergone two previous operations. Having sawn the jaw partly through on each side of the tumour, the operator applied the bone-forceps to complete one of the sections, when the outer plate of the jaw with the greater part of the tumour came away, leaving only a small portion of it adhering to the inner plate. Owing to the jaw being already divided, it was considered better to complete the operation as originally intended, and the patient made a good recovery. The preparation referred to illustrates also the connection of the teeth with fibrous tumours, a diseased molar tooth being implanted in the upper part of the tumour.

Though of slow growth under ordinary circumstances, a fibrous tumour of the jaw, if irritated by the injudicious application of useless remedies with the view of producing absorption of the growth, may assume enormous proportions, and destroy life by the irritation and continuous discharge it gives rise to. A preparation in King's Col-

lege Museum shows a fibrous tumour of large size, involving nearly the whole of the left side of the lower jaw. Its interior is hollowed out into a large cavity with sloughing walls; and there is a large aperture communicating with it, surrounded by healthy skin. The patient's portrait, taken about six weeks before her death, is seen in Fig. 10. The case was evidently one of ordinary fibrous tumour de-

Fig. 9.

pending originally upon diseased teeth, which, by dint of incisions and injections of iodine into the growth, followed by a seton introduced through the skin, was brought into such a condition that, upon the receipt of a blow, it rapidly brought the patient to her death-bed.

Fig. 10.

A remarkable and unique feature in connection with the case of large tumour above referred to is seen in Fig. 11, which shows the front of the base of the skull of the patient. The long-continued pressure of the tumour of the lower jaw has given rise to a remarkable

Fig. 11.

contraction of the hard palate and alveolus, the teeth being crushed together so as to overlap one another; and at the same time an expansion of the malar bone and zygoma has ensued, which is accurately shown in the figure.

A large tumour of the same kind, weighing eighteen ounces, which has encroached upon the condyle and coronoid process and projected into the mouth as well as on the surface, is preserved in University College Museum (652), and was removed by Mr. Liston in 1846; and a similar growth, successfully removed by Professor William Beaumont, of Toronto, from a boy of 7, which is considerably infiltrated with calcareous matter, is in the Museum of the College of Surgeons (2218), and was originally considered to be cartilaginous. It weighed eight ounces avoirdupois, with a long diameter of $3\frac{1}{4}$ inches and a short diameter of $2\frac{1}{8}$ inches, and involved the whole of the left side of the bone.

Fibrous tumour is most frequently developed in the side of the lower jaw, where the space between the plates is larger than elsewhere, and may occupy the dental canal, as in a case of Mr. Cock's, in which the dental nerve passed through the tumour, necessitating its removal in two parts. Occasionally, however, fibrous tumour invades the symphysis, and here, owing to the restricted amount of expansion of which the bone is capable, absorption of the anterior surface takes place at an early date, and the tumour projects, involving also the adjacent bone. A preparation in University College (655) shows the symphysis affected in this way, which was removed, with a portion of healthy bone on each side, by Mr. Liston. A section shows the structure very well, and at the lower part a small cyst has been developed. In connection with this subject, another preparation in the same museum (654) is deserving of notice, being a fibrous tumour, of the size of an orange, connected with the back of the symphysis, and apparently, therefore, of the periosteal variety.

The *periosteal variety* of fibrous tumour is not distinguishable from epulis except by its size. Like epulis, it has spicula of bone springing from the jaw, permeating it for a short distance; and beyond them radiating lines may be seen in the fibrous tissue. Preparation 2221 in the Museum of the College of Surgeons, for which I was indebted to Mr. Lee, of the Salisbury Infirmary, illustrates this form of disease very well, the fibrous growth being closely connected with the periosteum of the front of the jaw. The disease may, however, almost completely surround the jaw, as the preparation in St. Bartholomew's Hospital, drawn by Sir J. Paget in his *Surgical Pathology*.

Enchondroma of the upper jaw is of uncommon occurrence, but the jaw may become involved in cartilaginous tumours springing from other bones of the face. Of this there is an example in St. George's Hospital Museum (XVII. 66), taken from a young woman who, seven years before her death, began to suffer from soft elastic tumours on the inner side of the orbits. Two years after, the right maxillary bone was fuller below the orbit than the left, and the right half of the bony palate was larger and more depressed than the other; but in neither of these parts was there any softening. Gradually the eyeballs were protruded, and the sight was lost. Two years later, it was noticed that the superior maxillary bones projected nearly an inch beyond the inferior, so that she had some difficulty in masticating. A portrait of this patient is preserved in St. George's Museum. The tumour was found to project into the cranium, the orbits, the antra, and the nasal, zygomatic, and pterygo-maxillary fossae. All the fossae were quite filled up by the growth, and the bones of the face and orbits extensively absorbed. The hard palate was pressed downwards, so that the teeth on the two sides deviated from their natural line, and the left central incisor crossed that of the right side. Microscopical examination of the tumour showed it to be composed principally of cartilage.

In the Museum of St. Bartholomew's Hospital is another *post-mortem* specimen of cartilaginous tumour of the face, from a lad of 16 (XII. 1773), occupying the situation of the superior maxillary bones, which are completely absorbed. Above, the tumour has extended through the left side of the base of the skull into its cavity, where it forms a large projection in the situation of the anterior lobes of the cerebrum; below, it is united to the soft palate; in front, it protrudes and distends the left nostril, and has caused the ulceration of a part of the integuments of the face. The outer surface of the tumour is nodulated; its interior, shown by the section, is formed of close-set nodules and masses of cartilage, partially and irregularly ossified, and in some parts intersected by layers of a softer, probably fibrous tissue. A portion of its external surface projecting below the left nostril has sloughed. This case is drawn in Mr. Stanley's illustrations to his work on *Diseases of the Bones*, and both it and the preceding preparation illustrate very well the tendency of cartilaginous tumours to invade all the surrounding structures, and fill the several cavities.

A remarkable case of recurrent cartilaginous tumour of the face, originating in the upper jaw, was under my own care, of which the following are the particulars:—The patient, aged 34, was admitted into University College Hospital on January 1st, 1868, with a large tumour of the right side of the face. When about 17 years of age he noticed a pimple on the right side of the nose, which increased pretty rapidly, and three months after (1851) he went into St. Thomas's Hospital, when Mr. Le Gros Clark operated, and removed a tumour as large as a walnut. He quite recovered, and was well for a few months, but within a year the tumour had returned. He was then admitted into King's College Hospital, under Mr. Partridge, who, in June, 1852, removed the tumour, which was of an osteo-cartilaginous character, oblong in shape, and of the size of a large walnut, projecting slightly into the antrum, and involving the nasal process of the superior maxillary bone, but in no way implicating the mouth or orbit. From this operation the patient made a good recovery, except that a small fistulous opening was left in the cheek. The man continued in good health until 1857, when he went to America, and soon after arriving there he found the tumour beginning to appear again, and in 1860 Professor Gunn operated, at Anne Harbour, in the state of Michigan, and removed the entire right upper jaw. The tumour, however, began to grow again rapidly, and projected on the face. The surgeons at Maple Rapids, where he lived, wanted to operate again, but the patient declined, and returned to England in 1865. Soon after this an abscess formed in the upper part of the tumour, which was lanced with great relief, but the incision thus made has never closed, owing to the stretching of the skin by the tumour.

The patient's appearance on admission was most unsightly (Fig. 12), the right side of the face being greatly disfigured by a large tumour, by which the eye was thrust completely aside, but without loss of

vision. Immediately to the inner side of the eye was an open granulating sore of the size of a florin, the result of the incision for the evacuation of matter already referred to. The tumour appeared externally to consist of two portions, separated by a horizontal sulcus, at the bottom of which the fistulous opening resulting from the second operation was still visible. The upper and more prominent portion had invaded the orbit, reaching to its upper border, and extending beyond the middle line of the nose. A small portion of this had, within the previous two months, projected through the left nasal bone. The lower portion of the tumour involved the ala of the nose and adjacent portion of the cheek, both of which were much distorted; on a small projecting portion of this the skin was adherent. Both nostrils were completely blocked, and had been so for months. Within the mouth it was seen that the whole of the right side of the hard palate had been removed; and in its place there was a smooth, red, oval mass, coming down to the level of the teeth of the opposite side. The scars in the middle line of the lip and on the cheek, resulting from former operations, were still visible. The tumour was solid, and not tender to the touch, the most prominent part being apparently osseous. There was no enlargement of the glands in the neck or elsewhere, and the man appeared in good health. The tumour had made decided progress within the previous few months, and he

was anxious to have it removed, to which, after a consultation with my colleagues, I agreed.

The patient made an uninterruptedly good recovery from the operation. The wound was kept clean by syringing with Condy's fluid; a plug of lint in the frontal sinus was removed on the third day after the operation, and the sutures on the eighth day, the incision being well united. The right eye, which had been much displaced, began gradually to recover its proper position. A fortnight after the operation, the patient was up and about the ward, and on February 1st he went out for a walk. On Sunday, February 2nd, he again went out, the house-surgeon not being aware that there was a bitter east wind. This he felt a good deal, and the next day his face was noticed to be swollen and red. This had increased on the following day, when I saw him, and it was evident that an attack of erysipelas was coming on. The patient was at once placed in a separate ward, and active treatment adopted. The erysipelas spread, however, and affected the throat, so that on February 7th he was able to swallow but little, and was becoming rapidly exhausted. By the frequent use of the stomach-pump nourishment was introduced into the stomach, and he rallied for a day or two. Symptoms of pyæmia, however, now manifested themselves, and the patient rapidly lost ground, and, after lingering for a week, died on February 17th.

At the post-mortem examination the incisions in the face were cicatrised, but the site of the tumour was granulating and encrusted with mucus in parts. On removing the brain, it and the membranes were found perfectly healthy; but the plate of bone between the frontal sinus and the cranial cavity was so thin that it broke in the removal of the brain. There was no appearance of any remnant of tumour either in the frontal sinus or elsewhere, the walls of the large cavity left by its removal being healthy (University College, 616). In the thorax there was abundant evidence of pyæmia, the lungs being filled with pyæmic abscesses. The tumour weighed nine ounces, and consisted of a loose cartilaginous material enclosed in a bony cyst, from which spicula were sent into the interior. At two points, and particularly at the most prominent portion of the tumour, the bone was of considerable thickness.

In many cases of enchondroma a certain amount of fibrous tissue is found mixed with the cartilage, and in some cases, particularly those of slow growth and of long standing, the fibrous has, to the naked eye, almost replaced the cartilaginous element. Of this, an enchondromatous tumour, removed by Mr. Square, of Plymouth, in November, 1866, and kindly given me by that gentleman, is an excellent example. The tumour was of the size of an orange, and occupied the right superior maxilla of a woman, aged 47. It had been growing ten years, and Mr. Square successfully removed it. The preparation, now in the Museum of the College of Surgeons (2216), and of which a section has been made, shows a surface closely resembling a fibrous tumour, but in which cartilage cells are readily found under the microscope. The preparation shows a deep groove in the buccal surface of the tumour caused by the teeth of the lower jaw.

The ossific deposit, beginning at several separate points, which is not infrequently found in connection with enchondromata of other parts of the body, may take place in enchondroma of the upper jaw. A very excellent example of this was published by the late Mr. Maurice Collis, of Dublin (*Dublin Quarterly Journal*, August, 1867), and the appearance of the patient is well shown in the lithographic illustrations which accompany that paper.

Enchondroma of the lower jaw is not common, but is found of two forms, the endosteal and periosteal, thus resembling fibroma. A case is recorded by Sir Astley Cooper, in his "Essay on Exostosis," and is remarkable both for the sound pathological views and strictly conservative treatment he therein advocates. The patient was 19, and had had a growth in the side of the lower jaw for three years. Sir Astley exposed the tumour and gouged it away, exposing the dental nerve, and the patient made a good recovery. Sir James Paget has recorded (*Medico-Chirurgical Transactions*, 1871), a very similar case of cartilaginous tumour in the lower jaw of a lady 45 years old. It had been growing during two or three years, extended along the space between the first bicuspid and last molar teeth, was deep set in the jaw, expanding both the walls, and rising to almost the level of the molar teeth. He gouged it out, leaving the base of the jaw untouched, and not cutting any part of the cheek or lip. It did not recur.

The periosteal form of enchondroma springs from the membrane covering any portion of the bone, but most frequently affects the body. It grows to an enormous size, and may cause death either by interfering with respiration, as in Sir Astley Cooper's case, or with deglutition, as in the case from which the preparation in the College of Surgeons (2215) was taken.

[To be continued.]