CLINICAL REMARKS

ON

AMPUTATION OF THE LOWER JAW.

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I THINK it may be safely affirmed that since the publication of Mr. Cusack's memoir on Amputation of the Lower Jaw, which appeared in the *Dublin Hospital Reports*, little has been added to our knowledge in reference to the technique of this operation. The line of incision, the method of bone section, and the difficulties and dangers connected with the procedure, as well as the after-treatment, are all dwelt on and described with a precision and accuracy that leave little to be desired or added to. The paper, in truth, constitutes a landmark that will always serve as a guide to the operating surgeon in dealing with such cases. One of these was an example of that comparatively rare condition termed multilocular cystic disease of the lower jaw. The late Professor Robert Adams has given a graphic description of the case, which he published in the *Dublin Hospital Gazette*, 1857, and a well-executed illustration of the tumour removed forms an attractive feature in Mr. Christopher Heath's exhaustive work on *Injuries and Diseases of the Jaws*. In this work, too, will also be found an illustration of another remarkable case of the same kind operated on by the late Dr. Edward Hutton; one I took a special interest in, as I was at the time of the operation one of Mr. Hutton's dressers in the Richmond Hospital, and had charge and took notes of the case for him. Of this case Mr. Heath has observed that "it is the best example of the disease hitherto known as cystic sarcoma with which I am acquainted." The specimen was formerly in the museum of the Richmond Hospital, but is now in the possession of the Royal University of Ireland.

As these cases presented many features of analogy as regards appearance, history, and pathology to one that I recently operated on in the Meath Hospital, a brief record of it will probably not be deemed devoid of surgical interest.

M. B., aged 29, a domestic servant by occupation, was admitted into the Meath Hospital under my care on November 14th, 1898. She suffered from a large and, it was stated, increasing tumour of the greater part of the left side of the lower jaw. The patient stated that the tumour was first observed in 1893. On March 20th, 1897, she presented herself at the Dental Hospital of Ireland, complaining of pain accompanied by swelling of the lower jaw on the left side. Mr. George Moore, one of the surgeons of that institution, saw her at this time, and has kindly furnished me with the following notes of the case which he took at the time:

Four years ago (1893) she suffered from excessive pain in this region, to relieve which a local practitioner extracted the left six-year lower molar. Two years now elapsed, during which time the patient was free from discomfort, but soon afterwards (in 1895) she noticed the jaw swelling in the region of the second left lower molar. This increasing advice was sought at a general hospital, and as a result an opening was made into what appears to have been a cystic tumour. Some fluid was evacuated, and the cavity packed on several occasions with lint. The swelling subsided, but in some months returned. The patient then sought advice at the Dental Hospital again. On examination, the wisdom tooth on the affected side was found absent, and had never been erupted nor extracted, while the twelve-year molar was present and badly decayed. Much swelling was present around the lower tooth, principally affecting the buccal aspect, and running backwards and upwards upon the ramus, the bone being evidently thinned. It was considered expedient to remove the remaining molar which, along with all other decayed teeth and roots, was extracted under ether. The molar tooth, without any evidence of fracture, came away, but it had no fangs or roots, nor did a probe passed into the socket detect any. The probe could be passed into a cavity of some size, but from which apparently no fluid escaped. The case was then sent to the Meath Hospital, and placed under my care.

On her admission, the deformity caused by so large a growth was very striking, so much so that it is a source of regret to me that a photograph of the patient was not taken previously to the operation. The patient stated that recently there had been great activity in the growth, and she suffered much, especially at night, from pain in the ear on the affected side. The family history was on the whole good. On inspection, the tumour was seen externally extending from behind the angle of the jaw to within an inch of the symphysis menti. On the buccal aspect the growth was found very prominent, and pushing the tongue towards the right side, and to a certain extent interfering with both speech and deglutition. The growth also extended downwards below the ramus of the jaw. The integuments over the tumour were apparently healthy, and were freely movable over its surface. The external surface of the tumour was hard, but on the inside, where it projected into the mouth, some portions of it were soft and crepitating.

The case being one which clearly indicated operative interference, I recommended removal of the affected part of the bone, and the patient willingly consenting, I commenced by making a free incision an inch behind the angle of the jaw, and carried it forwards and somewhat behind the bone to a point corresponding to three-quarters of an inch to the left of the symphysis menti, and then vertically upwards towards, but not through, the red border of the lip. The transverse facial artery was severed by this incision and both proximal and distal ends secured. With a periosteal raspatory, an opening at a point where the anterior section of the bone was to be made into the mouth was accomplished, and the bone divided by means of a chain saw. This section was effectually and rapidly carried out and without any difficulty. The soft tissues were thus, partly by the scalpel and partly by a raspatory, detached. On reaching the coronoid process and portion of the bone posterior to it, I found that the disease had extended much further backwards than I had anticipated. The coronoid was expanded by the cystic growth, and the same might be said of the cervix and condyle of the bone. This portion of the bone I have never previously seen affected in this manner. Owing to the cystic development here the bone, in my efforts to remove it at the articulation, broke down, and had to be removed piecemeal. At this stage of the operation the hæmorrhage was very severe, and I greatly feared some of the larger branches of the internal maxillary artery had been wounded. Happily I succeeded in arresting the hæmorrhage by ligation and pressure, and no further trouble from hæmorrhage was experienced. The wound was then securely packed with iodoform gauze, and the edges brought together by a continuous silk suture.

Fig. 1.—Patient after operation.

The patient rallied well after the operation, and suffered little from either shock or pain. The temperature and pulse remained practically normal, and the wound healed by first intention. The sutures were removed within a week; no trace of suppuration having ever been seen in connection with them. The local treatment of the wound consisted in frequent irrigation with a weak permanganate of potash solution. It is needless to say more than that the patient made an uninterrupted recovery, and returned home in excellent health and spirits in March, 1899. The accompanying illustration, taken from a photograph made by Mr. F. Fitzgerald, late clinical clerk in the Meath Hospital, gives a faithful representation of the patient at the time of her departure from the

hospital. Having regard to the fact that almost the entire of half the lower jaw was removed, it must be admitted that the result was satisfactory.

The tumour, as will be seen in the accompanying illustration, is an example, and a signally well-marked one, of the comparatively rare condition, multilocular cystic disease, formerly known as cystic sarcoma. It is, as already stated, similar in its growth and structure to the remarkable examples of the disease described and illustrated in Mr. Christopher Heath's work on *Diseases of the Jaws*. The case recorded above, however, differed in one respect from these—one which in no small degree added to the difficulties in the technique of the operation—and that was the extension of the disease so far posteriorly, involving as it did not only the coronoid process but also the cervix and condyle of the bone. This feature or peculiarity in the case, which added so largely to the difficulties of the operation, made it differ from any of the specimens I have read of, operated on, or seen in any pathological museum. The accompanying illustration of the tumour, taken from a photograph kindly made for me by my colleague, Dr. Scott, Professor of Physiology in the Royal College of Surgeons, gives an excellent idea of the appearance of the growth on a section being made of it (Fig. 2).

Fig. 2.—Tumour after removal.

The diagnosis of these tumours is at times surrounded with difficulty, and if the contents be fluid or partially so, the characters of chronic abscess, dental cyst, dentigerous cyst (follicular odontome), and multilocular epithelial cyst (epithelial odontome) will have to be differentiated. In Smale and Colyer's work it is stated that the last (epithelial odontome) "may be suspected if the swelling shows a tendency to be nodular. This form of tumour is likely to be mistaken for a medullary sarcoma, and the diagnosis between the two is often very difficult, but with the former there will nearly always be an absence of a tooth or teeth from the series."¹

There is much obscurity in connection with the origin of these bone cysts, and much difference of opinion exists among some acknowledged surgical authorities. Mr. Heath states that this origin is probably in the cancelli of the bone, and due to irritation caused by neighbouring teeth, and also that the multilocular form of bone cyst seems to be more closely connected with the teeth than the single cysts.

Distension and absorption of the alveoli go on as the cysts increase in size, so that the walls at length become membranous, and the macerated bone shows great gaps in its outline.—Heath.

At variance with these views we have Mr. Pollock's statement that these cysts appear to be independent of either any tooth irritation or of any previous cartilaginous deposit.

The theory of tooth irritation has also an advocate in Mr. Salter, who has observed that the cysts only arise "when the tooth or teeth associated with them are embedded in the substance of the jawbone;" but in another place we find his somewhat contradictory statement that "impaction of a tooth

is not necessarily a cause of these serous collections, the former being common, the latter comparatively rare."

Mr. Coote² also holds the view as to the cysts being the result of irritation produced by decayed teeth; Magitot³ that they resulted from the fusion, and sometimes subdivision, of several dentigerous cysts, those, namely, connected with imperfectly developed teeth.

The view that they are due to an abnormal development of the enamel organ has also been advocated by Falkson⁴, and, lastly, the theories of Eve⁵, and endorsed by Malassez,⁶ that these growths have not a dental origin, but that they are neoplasms of an epitheliomatous nature.

According to Ziegler⁷ these "Zahncysten" may originate from cystic dilatation of a tooth socket of a developed tooth, as well as through a corresponding degeneration of buds "Sprossen" of enamel germ, or of the dental sac of a tooth in the course of development. In the latter case the cysts are lined with cylindrical epithelium. Orth⁸ maintains that the jaw cysts originate from tooth germs, and part also are cystic fibromata.

The late Sir John Tomes has observed that "Such cysts are tolerably frequently observed attached to the roots of extracted teeth. The process is probably identical with that resulting in the formation of alveolar abscess, but the process being less acute a serous cyst takes the place of a rapidly suppurating sac. As such cysts increase in size they produce absorption of the bony structures round them, and may in this way come to occupy the cavity of the antrum."⁹ As regards unilocular cysts this view is, I should say, most likely the correct one.

An interesting pathological feature that is observable in the case I have drawn attention to is the condition of the molar tooth that was extracted by Mr. G. Moore previously to the removal of the tumours. I allude to the complete absence of the fangs and the under surface of the tooth not showing any evidence of ulceration, being smooth, cup-shaped, and polished. The cause of this partial absorption of a permanent tooth is, like the origin of the bone cysts, involved in much obscurity.

Sir J. Tomes⁹ held that the cases of absorption of permanent teeth might be divided into two classes—first, "when the whole or part of the root of a permanent tooth is absorbed without reference to the growth of an adjoining tooth; and, secondly, when a portion of a permanent tooth is absorbed to make room for the eruption of a neighbouring tooth. The mechanism of the absorption which takes place when one tooth impinges upon another below the level of the gum is not fully understood. When the contact takes place above the gum no harm is done, but when at a lower level absorption is set up, whether by the periosteum being irritated by being squeezed between the crown of the advancing tooth and the cementum of the other or by some other process."

In connection with this subject the following remarks by the eminent dental surgeon, Mr. Mummery, of London, will be read with interest. They occur in a letter recently addressed to Mr. Moore:

"In all such cases which I have seen the absorbed surface exhibits the lacunæ of Howship, and in many portions a deposit of bone or cementum.

"I think there is no doubt that the factor in absorption of the roots of such teeth is the osteoclast, as in bone. I have preparations showing absorption of the roots of the teeth and the so-called absorption organ (the accumulations of osteoclasts) *in situ*.

"I mentioned your question to Tomes, and he agrees with me that the absorption of the root in these cases is exactly the same process that we see in the skull when the bone is excavated by the presence of an intracranial tumour, when the characteristic lacunæ of Howship and the osteoclasts occupying them are well seen."

The points of especial interest in connection with this case are as follows:

First, it raises the question as to the origin and differences, clinical as well as pathological, between the unilocular and multilocular cystic maxillary growths.

Secondly, the extension of the disease posteriorly to the temporo-maxillary articulation, a feature I have never seen before, and one which added in no small degree to the difficulties of the operation.

Lastly, the condition of the teeth, and the question that arises therefrom as to whether imperfect or arrested development was an etiological factor in the production of the growth, or an effect produced by the latter.

REFERENCES.

- ¹ *Diseases and Injuries of the Teeth*, p. 406. ² *Lancet*, October 10th, 1857. ³ *Archiv f. path. Anat.*, 1879. ⁴ *BRITISH MEDICAL JOURNAL*, 1883. ⁵ *Archiv. de Physiol.*, 1885. ⁶ *Lehrbuch der speciellen Path.-Anatom.*, 8th Ed., p. 488. ⁷ *Pathologisch-anatomisch. Diagnostik*, 5th Ed. ⁸ *Dental Surgery*, p. 630. ⁹ *Ibid.*, p. 476.

ON THE TREATMENT OF ABDOMINAL PALPITATIONS.

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THIS well-known disorder, most common in women but not infrequent in men, is in all cases unpleasant, often distressing, and in some instances painful, so much so that patients are most grateful for relief.

Palpation of the abdomen during an attack reveals an abnormally forcible pulsation of the abdominal aorta. Not only so, but often in the intervals also we find a pulsation which is undue, whether compared with that of the patient during health, or with the average amount in other healthy persons. In the quiescent condition it is often more evident just above the bifurcation than in other accessible portions. It also may extend to one or both of the iliacs. And we also may find such a condition in persons who are not sensible of throbbing. On superficial pressure it may not appear to be so, but on deep pressure it is evident that the pulsation is confined to the aorta itself. Such pressure elicits distinct, sometimes extreme, tenderness. Whether this tenderness is situated in the coats of the artery itself, or in nerves distributed over its surface, or in both, may admit of difference of opinion, I incline to think that it is in the coats of the artery. We generally also find some, perhaps not considerable, disturbance, constant or intermittent, of some one or more of the splanchnic viscera. It is important to know that it may be associated, not only with functional or curable splanchnic disorders, but also with organic changes, such as carcinoma, and that in a position where it does not form a tumour in the *trajet* of the aorta, either in front of or behind it.

When we meet with undue pulsation in the radial artery we call it high tension. But in these cases there is no noticeable high tension in the radial, but often the reverse. Does this, then, prove that, contrary to all appearances, there is not an excess of tension in the abdominal aorta?

The throbbing of inflamed parts, the increased flow of blood and its more vehement projection through the arteries of an inflamed hand, Claude Bernard's experiments on the secretion of the submaxillary gland all show that there may be a tense state of limited arteries which does not extend to other parts of the circulation.

Experiments have led physiologists to the conclusion that in the rabbit the splanchnic vessels, inclusively, are capable of containing the entire blood of the body. Probably the same is true of man. They have also pointed out a fact which has, I fear, been but imperfectly assimilated by the practitioners of medicine. This is that the splanchnic and somatic (or skeletal) circulations are complementary the one of the other. That if we repress the blood from the other parts of the body it takes refuge in the abdominal organs and *vice versa*. Or, if we attract it to skin and muscles, we withdraw it *pro rata* from the abdominal organs and *vice versa*. Herein, it may be said in passing, is the chief, if not the sole and adequate, explanation of the benefits obtained by the Schott system. The baths attract the blood to the skin and the resisted movements to the muscles, and, by emptying the splanchnic circulation, relieve the stasis therein.

From all the above considerations, it seemed to me reasonable to conclude that in the case of abdominal palpitations appearances are not deceptive. That whatever may be the state of the somatic circulation, tested as it commonly is by the radial pulse, the abdominal circulation, as regards its

aorta and probably other arteries, is in a state of high tension.

The therapeutic test, suggested by these considerations, amply justified them. With the object of reducing arterial tension, our predecessors used to bleed. We have recourse most commonly to the nitrites, especially nitroglycerine, and it is this which I employ in these cases; it may be taken when the attack is on, but it is better to give it once or twice a day, or if needful more often. A small dose will be generally found sufficient to affect the disorder, and we thus avoid the unpleasant headache or flushing which larger doses produce. One two-hundredth of a grain every night is often sufficient, and this may be obtained either by a tablet containing that quantity or by cutting in half one of those containing $\frac{1}{100}$ grain.

The relation of the state of the aorta to the functional disorders of other organs is not quite certain. It may be that it causes them: or, on the other hand, it may be that they cause it. Possibly the relation may be in some cases the one and in others the other. But if, as the palpitations subside, the other symptoms remain, it will be necessary to attend to them. But it is surprising how the equalisation of the circulation affects the other miscellaneous symptoms in many instances.

An interesting illustration of this is curious though easily explicable. Nitroglycerine is commonly employed for the reduction of the force and volume of the pulse as tested by the radial artery. In the condition under consideration the radial pulse is at once rendered more full and forcible by the entrance into the somatic vascular area of the blood liberated from the splanchnic area.

I append short notes of the first and the last cases in which I have applied this method of treatment.

A lady past middle life had an attack of hæmatemesis to an alarming amount. This recurred twice in the course of four days. The last attack was as follows. In the forenoon she complained of great and painful abdominal pulsation. She then became pale, the pulse frequent, and very small and feeble, and she said she had "a faraway feeling." About six hours after she began to vomit, and brought up a large quantity of blood; a small portion was bright red, the remainder very dark. I came to the conclusion that all except the scanty florid first portion had been poured out in the forenoon, and that preceded as it had been by the vehement aortic pulsation, the hæmorrhage was due to an active determination of blood to the stomach. She had not had, nor did she have, any symptoms of ulcers.

I determined to administer nitroglycerine in such quantity and at such intervals as might be necessary to prevent any undue abdominal pulsation, and did so. She had no return of the hæmorrhage though many of incipient pulsation, and she made a slow but good recovery.

I have since seen two other similar cases. In neither did the hæmorrhage recur after the circulation had been controlled by nitroglycerine.

The second case also of a lady past middle life, has been under my care within the last few weeks. When I saw her she complained of uneasy and unrestful sleep, a total incapacity to think or to read, or to mix in society because of her inability to enter into conversation. In short, she felt perfectly wretched. She also had great, and often painful, abdominal pulsation, especially about 5 or 6 A.M. Her pulse was quiet and regular though rather small and feeble. She had been in a similar condition about two years ago, and, obtaining no relief from treatment, was recommended by her London physician to go into a "rest cure," which she did for five weeks, and came out very well. The same thing happened last year, and she was again sent to a "rest cure," and remained six weeks, but was not as well as at the end of the previous period. The present attack has lasted about a month. I gave her $\frac{1}{100}$ gr nitroglycerine at bedtime. The first night her sleep was more quiet and restful, and the next morning pulsation very much less. In three or four days all her symptoms had disappeared, and she was comfortable, bright, and happy. In both these cases the pulse developed under the treatment. This principle of treatment is applicable also to many cases of cold feet and hands; this symptom being due not to insufficient action of the heart, as is often supposed, but to contraction of the local arterioles,