LECTURE XLII.

DENTAL ABSCESSES AND FISTULÆ.

I. Suppurated submaxillary adeno-phlegmon—Mode of formation—Commencement by an adenitis consecutive to a lymphangitis either of the pulp of the tooth or of the alveolo-dental periosteum—Obscurity upon this point because anatomists have not sufficiently studied the dental lymphatic vessels. II. Phlegmon and dental abscess under the gum of the upper jaw—Probability of consecutive alveolar necrosis—Utility of the removal of the decayed tooth. III. Cutaneous dental fistula kept up by caries of the second upper molar of the right side with an indurated course extending from the fistula to the tooth. IV. Submasseteric abscess of dental origin—Quite extensive consecutive alveolar necrosis—Peculiar gravity of these abscesses—Their possible prolongation to the temporal region—Consecutive purulent infection—Necessity for large openings and washing out.

GENTLEMEN: We have recently had four patients affected either with abscess or fistula consecutive to caries of a tooth, and it will be sufficient to mention them to fix in your minds the principal varieties of suppuration of dental origin.

I. *Suppurated submaxillary adeno-phlegmon.*—The patient who is now in No. 20 shows you a quite common type. She is twenty-four years old, blonde, slightly lymphatic, generally enjoys good health, and has never had any scrofulous manifestation. She is not pregnant, and has never had any children. She knows that she has caries of the second molar of the left side of the lower jaw, and she has sometimes suffered from it, but never enough to decide her to have the tooth drawn, or, what would be better, to have it filled. More recently she has again suffered some pain in it which has prevented her from chewing her food upon that side; then, five days ago, she felt a rounded and painful tumefaction at the upper part of the neck under the edge of the lower jaw, and a little in front of its angle. This swelling increased and was accompanied by a febrile movement which compelled her to enter the hospital.

You found at first a uniformly rounded swelling of the superhyoid region, rosy in colour over a great extent, and of a deeper red at one point where the consistency was less than at others. There was heat appreciable by the hand, spontaneous shooting pain, and pain on pressure. The jaws were kept closed by a contraction of the muscles which prevented examination of the teeth.

After a few days fluctuation could be felt; I made as small an incision as possible, about half an inch long, not wishing to cause a large cicatrix. A small quantity of good phlegmonous pus escaped, but there still remained a pasty tumefaction formed by a considerable part of the inflammatory swelling which had not yet advanced to suppuration.

The following days, while the pus flowed from the wound, the lips of which were kept apart by a strip of frayed linen, this swelling diminished and terminated by resolution. To-day, the seventeenth day since the operation, the cicatrice is formed, there is no fistula, the patient can separate her jaws and eat. By placing her before a well-lighted window, I could easily see a carious loss of substance in the second lower molar. As it would be difficult to fill the tooth, I advised the patient to have it drawn, and warned her that if she did not consent she would be exposed to a renewal of the suppuration. But, as she does not suffer, she refused for the present to follow my advice, and I did not urge it.

Permit me now to explain the mode of formation and the course of this abscess, in what points it resembles the others of which I shall presently speak, and in what it differs from them.

It resembles them, first, in its starting-point, which was evidently the affected tooth. I do not mean by that to say that all inflammatory submaxillary abscesses are caused by carious teeth. There are some, and I have shown you examples of them during the year, which are consecutive to an affection of the mouth, others which start from a sore throat, that is to say, they may be caused by inflammation of any of the parts which, like the teeth and gums, send their lymphatic vessels to the submaxillary ganglions. In this case I believe in the dental origin, because it is the most common, and because I found no inflammation in the throat.

It differs in its mode of formation: for, among the phlegmons of dental origin, there are some which, having begun in the periosteum, confine themselves to the neighbouring cellular tissue, and sometimes to that which is more or less distant, and the lymphatic vessels have no part in the development. There are others, on the contrary, in which the inflammation first affects one or several lymphatic ganglions and then is propagated to the cellular atmosphere surrounding them, as takes place in other regions, and especially in that of the groin, during the formation of most of the acute bubos consecutive to non-infectious chancres.

It is with this latter form, which you have often heard me designate by the name of adeno-phlegmon, that we have to do here. For the affection did not commence on account of the proximity itself of the tooth, as is the case in phlegmons of periosteal origin; it commenced at a distance in the suprahyoid region, which I also call the submaxillary, there where, you know, lymphatic ganglions are found in considerable numbers, most of which are inclosed within the sheath of the submaxillary gland, and receive lymphatic vessels from the cavity of the mouth, and especially those of the teeth and gums of the lower jaw.[1] Further, the trouble began by a rounded, rolling, painful lump, like those formed by acute adenitis; then, in a second period, this rolling tumour was found enveloped in a uniform mass, which was the surrounding phlegmon.

[1] The lymphatics of the gums and teeth of the upper jaw communicate with the deep parotid ganglions.

This abscess differed, also, from others by its mode of termination. It has left neither fistula nor necrosis. You remember that the day after the incision I introduced a probe into the wound, and that I felt no denudation of the jaw at any point. I should undoubtedly have felt it if the starting-point had been an osteo-periostitis; for, in such a case, the periosteum is almost always destroyed or stripped off, and the naked bone can be felt. The ultimate course corresponded to this examination, for there remained no fistula, such as often persists after denudation, fistula due to the non-reproduction of the periosteum and consequent necrosis of the maxilla.

Events proceeded as follows in this patient. The dental pulp became inflamed about the caries. If I were sure that this pulp has lymphatic vessels, I should say that they had transmitted the inflammation to one of the submaxillary ganglions, and that this inflammation had been propagated to the surrounding cellular tissue, had become phlegmonous, and taken on the suppurative form.

But there is here a *nescio quid* which often intervenes in pathogeny. Many subjects have carious teeth without having adenitis; many have simple adenites which do not become phlegmonous, do not suppurate, and terminate by resolution. Some indeed, and we have lately had an example of it, have the adeno-phlegmon, but it terminates by resolution instead of suppurating. Now, we are never able to find the particular cause, under the influence of which the inflammation, starting from the pulp of the tooth, transmits to the ganglions an inflammation of one form rather than of another. It is always the question of individual aptitudes, varying with the subject, and with the moment in the same subject; a question which is surrounded with obscurities which render it everywhere insoluble.

Next, to admit a starting-point in a lymphangitis of the pulp of the tooth, we must be certain that lymphatics exist in this pulp. As for myself, I have never seen them, and I do not know if others have seen them. M. Sappey, the most competent of our anatomists upon this point, does not describe lymphatic vessels of the teeth; he mentions only those of the gums, and, according to him, those of the lower jaw empty into the submaxillary ganglions, those of the upper jaw into the deep parotid ganglions. I admit that I am nevertheless disposed to believe in the existence of lymphatics of the pulp, according to the facts furnished by the clinic. The submaxillary ganglions become painful so easily and so promptly after caries of the lower teeth that it seems to me difficult to explain without a lymphangitis originating in the pulp. If it is not the latter which is at fault, it must then be the lymphatic network of the alveolo-dental periosteum, which is better demonstrated, I believe, than that of the pulp; or, perhaps it is that of the gum to which the affected tooth may have transmitted its inflammation; but I should then be surprised to see so often submaxillary adeno phlegmon without appreciable gingivitis.

And, since the occasion has presented itself, I point out to you another peculiarity. We very rarely see adeno-phlegmon caused by affections of the upper teeth. Is it because the lymphatic network,

either of the pulp or of the alveolo-dental periosteum, is too small? or is it for some other reason? I do not know.

But let us return to the practical standpoint. My principal object in insisting upon this subject has been to make you understand, gentlemen, that, among the abscesses of dental origin, there are some which are not followed by denudation, necrosis, or fistula, and which may get well without removal of the tooth which caused the affection. For, if I advised this woman to have her tooth drawn, it was not to cure the abscess or its consequences; it was only to protect her from a return of the same trouble, or from another of the same kind.

II. *Subgingival dental phlegmon and abscess of the upper jaw.*— You saw yesterday at the consultation a man who had had pain for several days, about one of those fragments of a carious molar which we call stumps, and in whom a painful swelling of the gum over this stump had appeared. As the swelling of the gum was tense and distinctly fluctuating, I at once cut it, taking the necessary precautions not to wound the lips with the blade of the bistoury while doing so. I opened it freely, because wounds of the mouth have a great tendency to close too soon, and there was reason to fear, in case cicatrization took place before the occlusion of the pouch, that the latter would again fill up.

The pus which escaped was mixed with blood and had a fetid odour, which is quite common in abscess of the cavity of the mouth.

This abscess resembles, by its origin, the one previously described. It was certainly an inflammatory process, starting from a carious tooth, that caused it. But with respect to its position, it differs in two ways: first, it was not developed so far from its starting-point; and, secondly, it did not begin by the lymphatic element. In this connection I wish to remind you of one remark: dental adeno-phlegmon arising in the lower teeth is not rare in the lower jaw; we see it arise much less frequently from the upper teeth. When caries of the latter gives rise to it, the inflammatory swelling ought to appear in the parotid region. But the clinic has not enlightened me very much upon this subject, because, in the rare parotid adeno-phlegmons with which I have met, with the exception of one case in which it was certainly due to caries of an upper wisdom-tooth, I was never able to determine positively if the starting-point of the initial lymphangitis had been in the teeth or in the mouth.

In this case it is probable that the inflammation starting from the affected tooth first gained the alveolo-dental periosteum, then the external periosteum, and the cellular tissue between it and the mucous membrane of the gum. It is then a subgingival and periosteal phlegmonous abscess. It is, however, possible that the pus may have formed under the periosteum, and that consequently the abscess has been subperiosteal. This is all the more probable because, after having made the incision, I passed in a probe and found part of the upper maxillary bone denuded. Still, I do not know, and fortunately it is without much importance, whether the periosteum has been destroyed because the abscess formed below it, or consecutively to the suppuration of its outer surface. It is the same here as in

acute subperiosteal abscesses of the large long bones; we know that periosteum disappears or is stripped off in consequence of these phlegmasiæ, but we do not know exactly which of these lesions has been produced, nor, above all, what has been the course and the succession of the phenomena.

The denudation warned us of one thing, that necrosis was possible. I say possible, and not certain, for in such cases we sometimes see the bone cover itself again and continue to live. But if the decayed tooth remains in its place, it causes another abscess after a certain length of time, a new denudation, and, if the necrosis does not then take place, it does on the third or fourth attack. It is to be remarked, moreover, that in these cases of gingival abscess the necrosis is generally limited to a circumscribed point of the alveolus, and is never very extensive; and that at the same time the concomitant osteitis does not become hypertrophic in the neighbourhood, as you know that it does in the long bones.

What will this abscess become? If the osteitis is not yet necrotic it will close, and everything will resume the condition in which it was previously, that is, the patient will keep his stump and will almost inevitably have the relapse of which I have spoken. If, however, necrosis has already occurred, and elimination must take place in the form of dust or of a splinter, suppuration will be kept up and the fistula will last until this result is obtained; now this does not take place, or at least it is not definitive, until the affected tooth has been removed from its cavity, a process which is always slow when it goes on spontaneously. We have recently seen at the consultation a woman who has had for nearly a year a fistula of this kind (gingival dental fistula) kept up by a very limited spot of necrosis on the lower jaw corresponding to a carious and loose canine tooth.

These fistulæ, which are very common, are not serious; but they keep up an unclean and inconvenient suppuration in the mouth.

To relieve the patients of these inconveniences: return of the abscess, slowness of elimination, and persistence of the fistula, there is only one useful advice to give them, and that is to remove the tooth or the stump which is the cause of the trouble. Whether it be that the operation itself removes the necrosed alveolar portion, or that the opening of the alveolus prepares an easier way of elimination, it is none the less true that after the removal of the tooth the suppuration and the fistula, if there is one, disappear promptly. I have given this advice to our patient, and he has followed it. The root of the carious tooth has been removed, and I consider the recovery assured.

III. *Cutaneous dental fistula kept up by the second upper molar on the right side, with a callous band between the fistula and the tooth.*—In connection with the preceding case I spoke of gingival, and consequently intra-buccal, fistulæ consecutive to abscesses starting from decayed teeth and the alveolo-dental periosteum, with imminence of necrosis. But it happens sometimes that abscesses of this kind, instead of projecting simply under the mucous membrane, open through the skin and cause cutaneous fistulæ which are much more disagreeable to the patients, since they occasion an ugly deformity. You will meet with

these osteo-periosteal abscesses followed by cutaneous dental fistulæ upon the upper jaw as well as upon the lower. In the first case they open upon the cheek, in the second upon the outer face of the lower jaw. Generally the concomitant necrosis is still very limited and will promptly disappear after removal of the tooth, removal which will always be the principal means of treatment. But in some exceptional cases, the necrotic osteitis having spread very far, you will have a more extended and slower necrosis, the elimination of which will only take place long after the removal of the carious tooth.

In the case which we have just seen at No. 6, ward Sainte Vierge, the cutaneous dental fistula is made remarkable by the existence of a very hard callous band which cleared up the diagnosis, and by the opposition which the prolonged contracture of the muscles which close the jaw offered to the examination of the teeth and the necessary removal of one of them.

It is a man 33 years old, very subject to toothache, who seems to have had gingival abscesses on several occasions. Seven weeks ago a new abscess opened spontaneously on his left cheek in front of the masseter and at the outer portion of the canine fossa, and remained fistulous.

You saw that the orifice, depressed in its centre, was surrounded by vegetations, and that it yielded a small amount of serous pus. This liquid was not as limpid and did not flow in as large quantities when he was eating, as it would if it had been a salivary fistula. A probe introduced into the fistula passed towards the upper jaw, and although I strongly suspected necrosis I did not find the characteristic hard and sonorous point.

The fistulous canal was about an inch long. By placing a finger in the mouth upon its course, I felt an elongated induration, which certainly corresponded to it. Seizing the cheek between the thumb and forefinger, one of them being placed within the mouth, the other upon the skin, I still better appreciated the elongated, hard, evidently callous cord, extending from the cheek towards the hindermost part of the upper alveolar arch. I called your attention especially to this callous cord; I told you that it was found almost always in cases of cutaneous dental fistula, that it was not very appreciable when the course was short, but that it was much more so when it had a certain length. I added that it was a great help to the diagnosis, because it indicated the certain existence of a carious tooth and necrosis, and the point where these lesions were to be found.

This double indication was all the more precious in our patient, because the probe did not reach the necrosed bone, and the exploration of the mouth was rendered impossible by the constriction of the jaws. This constriction, which is seen rather during the acute period of dental phlegmons than during the chronic and fistulous period with which we have to deal here, is more often met with when the last two teeth are involved than when the others are. In the absence of certain signs, all the others—the existence of a callous tract, its direction towards the posterior portion of the upper alveolo-dental arch, contraction of the muscles—united to make me believe in the existence

of an alveolo-dental lesion corresponding either to the wisdom-tooth or the second upper molar.

The indication was precise; to open the mouth, examine, and remove the tooth that was found to be affected. I should have temporized if the inflammation had still been in the acute state, for, at such a time, the attempts to separate the jaws by force sometimes cause an exacerbation of the phlegmasia, and, moreover, it is difficult to succeed, because the muscles are too firmly contracted. But in this case there was no acute inflammation, it was probable that the resistance was not great, and it was necessary to prevent the contraction, which was still curable, from giving place to an incurable retraction.

That is why I first took a spoon and passed its handle, on the flat, between the two rows of teeth, and then tried to turn it on its edge, so as to separate them. I did not entirely succeed, but I obtained a separation of a few lines. I told the patient, who for some time had been able to eat nothing but soups, and was anxious to have the functions of his jaws restored as quickly as possible, to use the spoon in the same way, five or six times during the day.

The next day I found the separation a few lines larger, and then substituted for the spoon the conical screw of boxwood, which I first introduced myself, so as to show the patient how to use it. At the end of three days enough separation had been obtained to allow me to discover, with the aid of a dental mirror, a deep caries behind the second upper molar, which was a little loose, and whose alveolus suppurated. I did not see the point which was necrosed, but the intra alveolar suppuration left me no doubt of its existence.

The tooth was then drawn. Four days afterwards the cutaneous fistula closed. To-day, the callous tract commences to grow smaller, and I count upon a definitive recovery.

IV. *Submasseteric phlegmonous abscess of dental origin. Necrosis of the lower jaw.*—Gentlemen, a young man, 23 years old, who was for a long time in No. 43, ward Sainte Vierge, and who returns to consult us from time to time, came to see us again this morning. On examining the interior of his mouth, I found, in the place of the second molar of the right side of the lower jaw, which I had removed two months ago, an alveolar cavity full of pus, with a denudation and sonority of the whole cavity and of the internal and external faces of the maxillary bone, over a surface of about one-third of an inch. There is then necrosis, but it has been preceded by a peculiar variety of abscess, of which I will now recall the principal details.

When he entered the hospital, about two months ago, this young man had had for seven days a painful and quite hard swelling of the right cheek, without redness and with a little fever.

He was unable to open his mouth, on account of a prolonged contraction similar to that of the preceding patient. At first I was not able to determine the condition of his teeth. But I felt with the finger a few asperities and inequalities upon the crown of the first and second molars of the lower jaw; I had, moreover, recognized that the wisdom-tooth was well out, and that consequently this was not of those affections which are sometimes caused by the difficult

and laborious evolution of that tooth. Examining as well as possible the posterior portion of the entrance to the mouth, I saw pus flow from the neighbourhood of one of the last molars, and I thought that it was a deep gingival abscess, the opening of which announced the approaching termination in a definitive cure or in necrosis. Still there remained a considerable swelling of the region of the masseter, and pressure exerted upon this region caused a good deal of pus to flow from the opening in the gum. We had then a deeper and more extensive abscess than those which we ordinarily see open in the neighbourhood of the gum, and I had to suppose that the spontaneous opening was not sufficient. Not only was it not sufficient, but it even closed in a few days, and then the swelling became greater in the region of the masseter and advanced evidently towards the temple. Then deep fluctuation became apparent in the first of these regions; I then made a transverse incision an inch long, parallel to and below Steno's duct, and also parallel to the principal branches of the facial nerve, some of which I should certainly have cut if I had carried the bistoury vertically. I divided, layer by layer, the skin and the whole thickness of the masseter, and it was only when the deep face of the latter had been divided that we saw a large amount of fetid pus escape; pressure exerted upon the temporal region, which was tumefied even then, did not cause pus to flow from the opening, thus proving that the phlegmon, although propagated to that region, had not yet suppurated there. The probe introduced through the wound reached the outer face of the branch of the inferior maxillary bone, but did not allow me to detect any denudation. After this operation, the pouch, which was kept open by means of strips of frayed linen, emptied itself little by little, the temporal swelling disappeared, and the jaws could be opened, thanks to the aid of the conical screw. Meanwhile, the opening in the gum was re-established, and suppuration persisted on that side, while it ceased and cicatrization took place in the cheek.

What was there peculiar in this patient, and in what did his dental abscess differ from those of which I have already spoken? It differed in this, that, starting from an affected tooth and its alveolus, the inflammation was propagated along the periosteum, as in gingival phlegmons; but instead of stopping in the gum, or burrowing in the submucous and subcutaneous cellular tissue, it made its way along the outer part of the jaw as far as the deep face of the masseter, and further to the sheath of the temporal muscle, moving along the coronoid process to the outer and perhaps the inner face of this muscle. The phlegmon thus propagated became submasseteric and temporal, although I cannot say whether, at this latter point, it was subtemporal or was limited to the connective tissue placed between the muscle and the aponeuroses. Then the submasseteric abscess formed, and, at the same time, the temporal portion of the phlegmon terminated by resolution. Finally, the submasseteric abscess terminated without fistula, and without necrosis of the branch of the maxilla. Only the portion of bone adjoining the carious tooth necrosed. We recognized, after-

wards, that this affected tooth was the second lower molar, and we removed it.

This was not the first time I had seen deep temporo-submasseteric phlegmon follow dental caries. In two of my private patients the suppuration invaded not only the submasseteric portion, but also the subtemporal portion of the phlegmon. I considered it necessary to make two incisions, one through the temporal, the other through the masseter muscle, and to pass a drainage tube from one to the other, in order to assure the evacuation of the collection. In one of the patients, the incision of the temporal muscle occasioned a flow of arterial blood, which rendered a rather laborious ligature necessary. Both patients recovered without necrosis of the branch of the maxilla, and did not even have the alveolar necrosis which we observed in our last patient.

Things did not pass so happily in a man whom I treated at La Pitié in 1867. After the submasseteric collection had been opened, purulent infection occurred and caused death. I did not find the maxilla denuded to a very great extent, nor its parenchyma in suppuration; the purulent infection seemed to me to have been caused by septicæmia consecutive to the decomposition of blood and of pus in the deep pouch.

The possibility of this complication authorizes me to tell you that the indication in abscesses of this kind is to open early and freely, and in both regions (of the masseter and temporal), when fluctuation can be sent from one to the other; in one alone, the first, when the collection remains exclusively submasseteric. Stagnation, and consequent decomposition, of the pus in the bottom of the foyer must be afterwards avoided by means of repeated washings.

As for the patient, we have only to wait for the elimination of the necrosis of the lower jaw, which is more extensive than usual, but still quite limited, and to advise frequent washings of the mouth, so as not to allow the pus to be swallowed.

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