

narrower than the old one. You understand that this reduction of the breadth of the nail diminishes the chances of a relapse, which are greater the nearer the edge of the nail is to the bottom of the groove in which it lies. I have several times measured the new nail a few months after this operation, and have always found it narrower than that of the other foot. I have already published my method of performing this operation,¹ and I shall now execute it before you in the following manner:—

1st Time.—To prevent pain I shall make use of a freezing mixture composed of equal parts of pounded ice and salt. The mixture will be made just before it is to be applied, and will be placed in a small bag made of thin muslin. I shall place this bag upon the dorsal surface and the sides of the great toe, cover it with a compress, and leave it in place for two minutes, when I shall remove it to see if anæsthesia has been obtained. If I find the skin still red and sensitive I shall re-apply the mixture and leave it until sensibility is entirely deadened.

I recommend this mode of anæsthesia in this operation, because, since the parts upon which we are to operate are superficial, it is useless to seek to dull the sensibility of the deeper ones, as we have to do when our incisions are carried beyond the limits of the skin, and consequently we are not embarrassed by the pre-occupations of general anæsthesia produced by inhalation. Local anæsthesia may be obtained by refrigeration with ether, but this process requires more time and does not produce so complete a result; and as the operation we are to perform is very painful, we must deaden sensibility as completely as possible.

2d Time.—Standing at the foot of the bed, and at the affected side, and having seized the toe firmly with my left hand, I shall pass one of the blades of a strong pair of scissors on its side under the nail as far back as the matrix, then turning the edge upwards, and closing the scissors quickly, I shall divide the nail lengthwise into two equal parts. Then with a stout pair of forceps I shall seize each piece in turn and tear it out. Sometimes the nail is friable and breaks; then of course the fragments must be successively removed. Do not forget that for this purpose you need a very strong pair of forceps, one whose blades will not twist under the violent effort you will have to make.

3d Time.—This consists in the excision of a strip of skin, leaving a wound which, though small, comprises in front a portion of the cutaneous ridge and abnormal vegetations, and behind the external lateral portion of the matrix. For this I shall take a bistoury, and make, behind, at the junction of the transverse and lateral portions of the matrix, a transverse incision one-quarter of an inch long through the entire thickness of the skin, and then carry it along the summit of the lateral cutaneous ridge to its anterior extremity. I shall then

¹ Gosselin, Sur le Traitement de l'Ongle incarné, Gazette Hebdomadaire, 1853, tome i. p. 7.

dissect inwards the flap thus formed, so as to include in it the entire length and thickness of the sub-ungual dermis for a breadth of nearly one-quarter of an inch, that is, its antero-lateral portion and the corresponding piece of the posterior portion or matrix.

I shall finish with a protective dressing made of a cloth covered with cerate, lint, compresses, and a narrow band. This dressing will be renewed every day for eight or ten days, at the end of which time the patient will be able to leave his bed, and perhaps the hospital.

During the last year you have seen me treat several patients in this way. In no case did any complication occur. In all the little wound healed, and the dermis dried in a length of time which varied from eight to fifteen days. When the patients left us they had no nail, but they could wear a shoe and walk by placing a rag or a little carded cotton over the toe. In only one of my sixty-four cases was the cure delayed by an angeioleucitis of the foot and leg, followed by small multiple abscesses along the course of the lymphatic vessels, and although delayed the cure was still obtained.

Upon none of the patients whom we have had this year have we as yet seen any return of the affection. But I have already told you that my method, although it removes the ulcerated skin and diminishes the breadth of the nail, still does not always prevent a relapse. In only five of my sixty-four cases has the disease returned, three boys and two girls, but I have had no example of a second return. Consequently the most unlucky have had to undergo the operation only twice. I have seen again several of them who had then passed the age of 25 years, and in whom the affection had not returned, and I have yet to see a relapse in any of my patients who have passed the period of youth.

LECTURE II.

SUB-UNGUAL EXOSTOSIS OF THE GREAT TOE.

Description of antecedents and symptoms—Diagnosis—Importance of age and sex; it is a disease of youth, more common in girls than in boys—Anatomical characteristics—Analogy to epiphysary exostosis, and to naso-pharyngeal polyps—Treatment—Possible relapse—Cessation of this tendency after adolescence.

GENTLEMEN: I have here a small piece which I removed the day before yesterday in your presence from the great toe of a girl 20 years old. She was a dressmaker who had been admitted into the hospital a few days before to be treated for a tumour as large as a small nut occupying the interior and superior surface of the left great toe at its

anterior extremity. This tumour was first noticed a year ago. It was then much smaller and gave no trouble, but during the last six months it grew larger and was troublesome. The patient was incommoded by her shoe, suffered when walking, limped at times, and could not walk any distance. During the last few days the tumour became excoriated, suppurated a little, and caused redness, itching, and swelling of the whole toe. The patient, finding herself then quite unable to walk, applied to us for relief.

The tumour was round, reddish, partly hidden by the nail, which was pushed upwards, and partly uncovered by the frequent cuttings of this nail which the patient had made in the hope of thus being able to relieve the pain caused by its constant pressure upon the tumour. At the points thus laid bare, the lump showed us a very adherent reddish covering, which was nothing else than the sub-ungual dermis intimately united to it. At the anterior extremity this skin was redder, and consequently more vascular, than at the other points; at the same time it was thickened and flabby, and presented an appearance similar to that of the vegetations about an ingrown nail. At the upper part you saw a round superficial ulceration, one-quarter of an inch in diameter, presenting a grayish surface and a sero-sanguinolent exudation. I asked the patient if this ulceration had been caused by the application of a caustic; for I have seen two cases in which an attempt to destroy the tumour with Vienna paste was unsuccessful and left behind a small rebellious ulcer. Such, however, was not the origin in this case; the solution of continuity was probably occasioned and kept up by the pressure of the shoe, and it was this that caused the inflammatory symptoms a few days before the patient entered the hospital. You will find this peculiarity mentioned in some of the observations published upon this subject, especially in Dupuytren's *Lçons Orales*. Examining the consistency of the tumour, we found it flabby in the superficial layers, and hard and bony in the deep ones. Finally, seizing the tumour with the left hand and holding the foot and toe firmly with the other, I found there was no mobility, that it was firmly adherent to the terminal phalanx.

After having determined the preceding symptoms, you saw that I did not hesitate a moment about the diagnosis: *sub-ungual exostosis of the great toe*. What other affection could it have been? It was not a phlegmon nor an abscess, for it presented neither the softness, nor the pastiness, nor the fluctuation found in those, and furthermore had grown much more slowly. The intimate adherence of the tumour to the phalanx left no doubt as to its origin in that bone. But was there no reason to think it might be an osteo-sarcoma? The ulceration, the oozing, at times sero-sanguinolent, the constant pain might have awakened this thought. Indeed, I treated at the Hôpital de la Pitié a young girl sent to me by a physician who thought she had a cancer of the great toe. He had been led to form this diagnosis by the presence of an ulceration and suppuration, similar to those which we have just seen, and coincident with a larger volume and more abundant vegetations.

But I rejected such an opinion, and admitted an exostosis, for the following reasons:—

1st. *The Age*.—Although I have seen an example of sub-ungual exostosis in a woman 47 years old, it is none the less true that this, like ingrown toe nail, is a disease of youth. Dupuytren, who was the first in France to give a clear and methodical description of this affection, reports five cases in which the patients were from 20 to 25 years old, but in all of them the disease began at about the age of 18. Dupuytren, however, although mentioning the age of each of his patients, did not call attention to this fact. Legoupil,¹ on the other hand, clearly points out adolescence as one of the principal predisposing causes, for, he says, "most of the cases within my knowledge are confined between the ages of 15 and 20, and I found none who had passed their 26th year." It is certain that Legoupil speaks not of cases which he had himself observed, but of those which he found recorded, and, indeed, it is incontestable that almost all such belong to the end of the period of adolescence, although the authors do not call attention to this fact. Still it is easy to understand how this etiological idea may have escaped the notice of many persons. Sub-ungual exostosis is rare, and each surgeon, having seen only a few examples, and having seen them only at long intervals, may have considered the similarity of age as the result of chance. As for me, I have preserved the record of only eight patients. Seven of these were aged as follows: two, 19 years old; two, 20; one, 21; one, 24; and one, 25; but in all the disease commenced one or two years before I saw them for the first time. I said just now that I had had one patient 47 years old; that proves that this, like ingrown toe-nail, may be developed in the adult; but it is exceptional, and we may consider it the rule that sub-ungual exostosis is a disease of youth.

2d. *Sex*.—Our patient was a young girl. Now, the analysis of the cases shows that, unlike ingrown toe-nail, this affection is more common among girls than among boys. Dupuytren's five cases were all girls. Legoupil points out that the ten cases of which he knew were all young girls. Of mine, five were girls, three were boys. Although in the printed records you find girls mentioned more often than boys, still you will meet with the mention of boys often enough to be authorized to believe that the proportion differs from that which exists for ingrown toe-nail. I can offer you no figures to prove this, since I have only eight personal cases, and that is insufficient to establish a rule. But connecting with my results the impression left upon me by reading published cases, I believe that relatively there are more boys affected with sub-ungual exostosis than there are girls affected with ingrown toe-nail. As to the diagnosis, however, the question remains the same. The sex was a circumstance favourable to the opinion that it was an exostosis rather than a cancer, and it was from this point of view that I was led to speak to you of the influence of sex. I am absolutely unable to explain this predilection for the female

¹ Malgaigne's *Revue Médico-Chirurgicale*, tome viii. p. 21 (1850).

sex, a predilection which you will not find in the other diseases of youth.

3d. As to the ulceration, the exudation, and the pains, which remind us of ulcerated cancer, you must remember that these incidents are quite frequent in sub-ungual exostosis. The cause is topographical; it is the pressure of the shoes while walking that occasions them. The pain is furthermore due to the sensibility, normally very great, of the sub-ungual dermis which is affected by the inflammation, to the ulceration, and the lack of protection by the nail, the limits of which are surpassed by the tumour and are generally much reduced by cutting, as in this case. This cutting off of the nail is all the easier because the nutritive trouble produced by the morbid growth is followed by the loosening of that part which covers it.

Perhaps if the tumour had been less voluminous it might at first have been taken for a simple ingrown nail. You noticed, however, and this is always the case in sub-ungual exostosis, that the vegetations were not lateral, but placed above and in front. I admit that the anterior edge of the nail may have contributed to their formation, and that consequently they may have had the same origin as those of ingrown toe-nail, but in primitive and uncomplicated ingrown toe-nail the affection is upon the side and not on top, and it is not accompanied by a tumefaction which raises the front part of the nail, and advances beyond the anterior edge, as is the case here.

The diagnosis having been made, we have to ask ourselves whether the etiological diagnosis ought not to be completed by the indication of some general cause other than the age and sex. You often hear us speak of syphilitic exostoses. I have examined and questioned this patient, and have not found, and have no reason to suspect, syphilitic antecedents. Even had I found them, I should doubtless not have attributed this exostosis to them, for my own experience and that of other surgeons have taught us that sub-ungual exostosis of the great toe, and that of the other toes, and also those of the fingers,¹ are not of syphilitic origin. The same is true for the other exostoses of young people, and we find in this circumstance another reason to justify the separate description of the diseases of youth upon which you hear me so often insist.

Pathological Anatomy.—Of what was this tumour composed? Before removing it I told you what it would probably prove to be, but now that we have the piece in our hands I can give you a more exact account. On the surface you see the sub-ungual dermis, below it, but intimately united with it, is a white layer, fibrous in appearance, one-eighth of an inch thick, which seems to the naked eye to be formed of dense fibro-cartilaginous tissue, but the microscope fails to discover any cartilaginous cells in it, and shows it to be formed in reality of very dense fibrous tissue. Under this, and again con-

¹ Sub-ungual exostosis may be developed upon the other toes and upon the fingers. All authors have pointed this out. I have had one example upon the third toe, and one under the nail of the index finger of the right hand. But it is infinitely more frequent on the great toe.

nected closely with it, you see a mass of bone, nearly one-quarter of an inch thick, formed in part by the abnormal growth, and in part by the portion of the phalanx from which it came. The tumour then was not a pure exostosis, it was an exostosis covered by fibrous tissue, or, if you prefer, an osteo-fibrous growth. In this respect it differs from other exostoses of youth, which are formed exclusively of bony tissue, and it has some analogy to naso-pharyngeal fibromas which spring from the bone, but are formed exclusively of fibrous tissue. That is to say, that in adolescents, and by the fact of the growth of the body, perversion of nutrition leads sometimes to an excess of bony tissue attached to the bones themselves, sometimes to an excess of fibrous tissue attached to the periosteum, sometimes to a simultaneous exaggeration of both bony and fibrous tissues. It is this last variety which we have before us, and this was also the case in the other examples which I have had occasion to examine. There may be cases in which the exostosis is purely bony, but those which I have observed have been such that I am authorized to tell you that the tumour generally is mixed, that is to say, osteo-fibrous.

Treatment.—There is no reason to hope that these tumours can be removed by internal treatment, and I have no facts even which permit me to believe that, left to itself, the disease will get well by simple increase of age. I had then to offer to our patient only an operation, and this is the one you saw me perform. First I removed the nail after local anæsthesia by means of a mixture of ice and salt as in the operation of ingrown toe-nail; then I isolated the tumour by two curved incisions, and detached it with a strong bistoury, hollowing out a little the upper and anterior surface of the phalanx to a depth of about one-sixth of an inch. In doing this I proposed to remove together with the tumour all its roots of implantation, so as to protect the patient from a return of the affection. The bone offered but a slight resistance; if it had been harder I should have used the gouge and mallet. A simple dressing, the same as for an ingrown toe-nail, terminated the operation.

This operation differs from Dupuytren's in this, that he shaved off the base of the tumour horizontally with the blade of the bistoury, while I used the point, forcing it in first on the inner then on the outer side, holding the tumour, meanwhile, with pronged forceps. The bony substance resisted a little, but by using some force, I easily overcame it.

You will find in the books other modes of treatment. Liston (of London) and Lenoir (of Paris) preferred disarticulation of the outer phalanx, in order the more certainly to prevent a return of the trouble. Dr. Debrou, of Orleans, animated by the same desire, thought it sufficient to amputate in the continuity of the phalanx, forming a dorsal flap out of the sub-ungual dermis, and a plantar one. This skillful surgeon based his operation upon two dissections which had shown him that the origin and implantation were upon the anterior border of the phalanx, and extended so short a distance upon its upper surface that amputation at the point indicated might be made

with the certainty of removing all the disease, and preventing its reproduction.

Gentlemen, I do not wish to exaggerate the danger of amputation in contiguity, and still less of that in continuity, but still this danger is certainly greater than that of the ablation to which I give the preference. The slight excavation which I made so as to pass beyond the limits of the disease, and to the usefulness of which I called attention in 1861,¹ appears to me quite sufficient to protect the patient from a relapse. At least in none of the eight persons upon whom I have operated in this way has the growth returned, and even if it should return once, I feel convinced that if the patient had reached the age of 25 or 26 years at the time of the second operation, another return would not take place, the age which predisposes to this kind of production having been passed.

LECTURE III.

NON-SPECIFIC EPIPHYSARY EXOSTOSIS OF YOUTH OR EXOSTOSIS OF DEVELOPMENT.

Description of the disease—Incurability by internal treatment—Operation useless, because the tumour is indolent and without danger, and will cease to grow after adolescence—Surgical intervention reserved for some exceptional cases.

GENTLEMEN: As we finished the visit this morning we were stopped by a young man, 19 years old, whose father came to ask my advice about a tumour situated upon the inferior and internal portion of his son's right knee. The tumour first appeared when the boy was 16 years old, it has grown little by little without causing any pain, but now that it has reached the size of a lady apple the young man and his parents begin to worry about it, and wish to know if it cannot be removed. You saw that the tumour was round, slightly knobbed, and so hard that there was no doubt about its being formed of bone. The skin that covers it is normally soft and movable. Seizing it with one hand, and fixing the leg solidly with the other, I recognized that the tumour was tightly adherent to and confounded with the inner tuberosity of the tibia.

Consequently I did not hesitate to pronounce the diagnosis exostosis, and you heard me add, exostosis of adolescence. By that I wished you to understand that there are developed in adolescents exostoses which are not due to a specific cause, but which are purely local lesions unaccompanied either by pains or marked functional troubles,

¹ Bulletin de la Soc. de Chirurgie, June 12, 1861.

and which will not disappear under the influence of a general treatment.

You often see in the surgical wards, and you will hereafter meet with in practice, patients bearing tertiary syphilitic exostoses. Sometimes they are young people, but more often they are adults, and in any case the diagnosis indicates at once the existence of a general cause, syphilis, under the influence of which the lesion has been produced, and behind this cause the possibility of a disappearance under the influence of an appropriate treatment.

On the other hand, you will often hear me call your attention to bony swellings which I call *hyperostoses*. I shall tell you that these hyperostoses sometimes follow osteitis of infancy or of youth, but in such a case last throughout the patient's life, and become from time to time the seat of fresh inflammatory action, and even of necrosis. I shall further show you that these hyperostoses may form on adults, especially after a fracture.

But in the case of this young man you see there has been no intervention either of the syphilitic cause or of an antecedent osteitis. We have here a very circumscribed, indolent, bony swelling, which is due to no appreciable cause, and which can be explained only by an aberration or excess of bony development at certain points of the skeleton, at the time when the system is working to complete this latter, an aberration comparable to that which causes the formation at the same age of sub-ungual exostosis and naso-pharyngeal polyps. Only, while in this case the production is exclusively bony, you remember that in sub-ungual exostosis it is osteo-fibrous, and in the naso-pharyngeal polyps exclusively fibrous.

I said that you would meet with analogous cases in your practice. You will find them oftener upon the lower than the upper limbs, and in the neighbourhood of the extremities rather than upon the body of the bone. In this connection I accept willingly the opinion uttered by M. Broca¹ before the Société de Chirurgie upon the origin of these exostoses in the border of the epiphysary cartilage, and more often upon the side than in front or behind, and with him I give them the name of epiphysary exostoses. But I should like to be sure that my learned colleague had had the occasion, which I, for my part, have not had, to verify the fact upon the cadaver. On some subjects you find many at a time. In a case presented by M. Marjolin² to the Société de Chirurgie, there were a great many of them, and they were symmetrical, that is, they occupied the same place and had the same size on the right and on the left. It is true that this was a child six years old; but although this lesion is generally seen during youth, yet like the other lesions of this age it sometimes occurs in children.

When the father asked me repeatedly what I thought should be done for the tumour, you heard me answer, "Nothing." The exostosis causes no functional trouble, no pain; if there were any chance that we might cause it to disappear by inoffensive external or internal

¹ Broca, Gazette des Hôpitaux, 1865, p. 295.

² Marjolin, Gazette des Hôpitaux, 1864, p. 344.