OBSERVATIONS ON CLEFT PALATE; WITH CASES ILLUSTRATING THE NEW OPERATION OF STAPHYLOGRAPHY.

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FOUR years have now elapsed since I had the honour of reading some observations on Cleft Palate, and the operations for the relief of this malformation, before the Royal Medical and Chirurgical Society; and three years have passed away since that communication was made public in the *Transactions* of the Society.¹ During this interval my attention has been very frequently called to the same subjects; and as the views which I then advanced were in most respects of a novel character, I feel in some degree bound to state the results of further experience regarding them. In the second edition of my work on *Practical Surgery*,² I gave further proof of the accuracy of my views, and at a later date again referred to the subject, in one of the lectures at King's College, which was subsequently published in the *Medical Times*,³ under my own superintendence. The views regarding this malformation, and the particular operation resorted to for its relief, are as yet, I believe, so little known to the profession, that I trust I may not be deemed presumptuous in again endeavouring to draw the attention of my brethren to subjects which, I am disposed to think, have had less consideration than they really deserve. In France, in Germany, and in America, many distinguished surgeons have written upon staphyloraphy, and numerous examples have been given of the success of the operation; but, strange to say, the proceeding has attracted little more than casual notice from the surgeons of Britain. Since Alcock first performed the operation in this country in 1821, it has been frequently repeated, but at dates so few and far between, that success, when achieved, has produced but little impression either upon the profession or the public. With few exceptions (among which I may refer to the brilliant examples occurring to Sir Philip Crampton⁴), the results of surgical interference have been so unsatisfactory, that teachers have done little more than describe the process which was followed by Roux, to whom the honour is due of having devised and first performed the operation. My own personal experience in early life in such cases had led me to conclude that an operation could only be successful in the most favourable instances, and it was not until I had made a careful anatomical examination of the parts, that I became convinced that more might be done by the surgeon than had yet been accomplished. At least it appeared to me that the operation might be put upon a more scientific basis, and that surgeons might be made aware of the nature and effects of the hap-hazard collateral incisions which had been pro-

¹ Vol. xxvii.

² P. 530.

³ Vol. xvi. 1847.

⁴ Dublin Journal of Medical Science, July 1, 1843, vol. xxii.

posed for the purpose of relaxing the soft palate during the period required for union in the mesial line. Roux's experience in the operation had been great, and his success was deemed very satisfactory,—two-thirds of the simple cases, and one-third of those which were complicated, having derived benefit from the proceeding. My friends Dr. Mütter, of Philadelphia, and Dr. J. M. Warren, of Boston, had achieved much greater proportional success: for out of twenty-one operations, Dr. Mütter had succeeded in nineteen; and Dr. Warren had been equally successful in thirteen instances out of fourteen. Results like these might well content the most sanguine. It was not, then, with the hope of shewing greater numerical results that I was first induced to write upon this subject, but because I had acquired a knowledge of the anatomy and physiology of the parts of which I believed surgeons to have been previously in ignorance, and upon which I had founded views and proceedings more in accordance with scientific surgery than those hitherto acted on, and which, if proved to be correct, might enable the surgeon to calculate on the result of the operation with a certainty heretofore unknown. I venture with great diffidence to use such language with reference to a subject, in connexion with which the names of the most eminent surgeons of the day may be found; but it is beyond dispute, I presume, that the anatomy of cleft palate had never been described until I had the honour of doing so, nor had there been any accurate allusion made to the actions of the parts in the various modifications of the operations originally performed by Roux, which had been suggested by that gentleman himself, by Dieffenbach, Liston, Mettauer, Warren, and others. I must refer to my original paper already alluded to, for various particulars which need not be repeated here. It will be sufficient for my present purposes if I touch upon the leading features of that communication.

The extreme mobility of the two portions of the soft velum in cleft palate had attracted the notice of all observers, but little, if any, attention had been directed to the moving powers. It was the custom in examining a case of the kind, for the purpose of determining upon an operation, to be guided by the facility with which the two portions of the uvula come together during deglutition. If a person with cleft palate be desired to swallow a little water, slowly and with the mouth partially open, the back parts of the fissure may be seen to approach each other, and in most instances actually come into contact. If they seem to do so readily, the prospects in this respect are favourable for an operation, and *vice versa*. The cause of this movement had never, I believe, been inquired into. So accurate an observer as Malgaigne¹ had been content to state, that it was “a muscular action of which it is difficult to give an explanation.” The movement is clearly attributable to the superior constrictor of the pharynx and the upper portion of the middle constrictor. The semicircle, which these muscles form on the back and sides of the pharynx, is, during deglutition, drawn into a straight line almost, the fibres come forward, inwards, and some of them downwards, so that the soft structures

¹ Médecine Opératoire, Paris, 1834, p. 486.

immediately in front—being the two portions of the split palate—are pushed in similar directions, and thus the posterior part of the fissure is made to close. The anatomist is more familiar with the action of pulling than that of pushing, as the result of muscular contractions. The lateral movements of the soft margins of the fissure could not escape observation, but, in so far as I know, they had never been accounted for. Doubtless any anatomist would have guessed that the levatores palati caused the elevation of these parts. He could not, however, have supposed that the palato-pharyngei could enlarge the fissure; on the contrary, in accordance with the doctrines of Dzondi and Müller (which are those usually entertained), he might suppose that these last-named muscles would in reality close the fissure, for their action, in the normal state of the parts, is to bring together the posterior pillars of the fauces. An examination of the course of the fibres of these muscles in the cleft state of the palate will shew beyond a doubt, that one of their actions will be to pull the edges asunder: in this state of the parts the anterior, or upper extremity of each muscle, is attached to the posterior margin of the osseous palate, and the fibres in their progress downwards, towards the sides of the pharynx, form a convexity upon the margins of the soft flap (in fact, it is this convex part which constitutes the most bulky portion of the flap): thus the action of each muscle tends towards the straight line, the parts are drawn asunder at such a time, and consequently the gap is enlarged. In the ordinary condition of the palate, these muscles have their fixed points above in the mesial line of the soft palate, and acting towards that line, they must necessarily close or cause the posterior pillars to approximate, in accordance with their supposed functions. Perhaps during deglutition in the cleft state, the upper margin of the superior constrictors forms, for the instant, a kind of fixed point, which permits the lower portions of the palato-pharyngei to act in the normal manner; but during the quiescent state of the constrictor muscles the palato-pharyngei, when exerted to action, must tend to enlarge the fissure in the mesial line. The tensor (or circumflexus) palati seemed to me to possess so little muscularity, and besides to have such a limited sphere of action, that I deemed its influence upon the movements of the palate as of little consequence, and I entertained similar views with regard to both the palato-glossus and azygos uvulæ.

In accordance with these anatomical and physiological data, I inferred that if the chief muscular action affecting the soft palate could be done away with,—either for a short time or permanently,—there would be a greater probability than ever of union taking place in the mesial line when the parts were united by the process of staphyloraphy, and on this principle the proceedings which I recommended were founded. As a preliminary step to the ordinary operation, I suggested the division of the levator palati on each side, and also, if it seemed needful, of the posterior pillars of the fauces, whereby large portions of the palato-pharyngei might be cut across. I also then thought that the anterior pillars, each containing the palato-glossus, might possibly require division. To effect these different incisions, I used a small peculiarly

curved blade¹ for the levator muscle, and common curved scissors for the others.

These doctrines have been acted on ever since the subject was made public, and I am more than ever satisfied of their correctness. Experience has taught me the propriety of certain modifications, and given me such further insight into the whole subject, as to induce me to continue the publication of the "observations" which I have had the opportunity of making during the last three or four years. By far the greater number of cases of cleft palate which I have recently seen, have been unfit for operation. Many have been infants and young children, on whom I believe it is impossible to effect any such proceeding, and in many of the adults the gap has been so wide, or the soft parts have been so narrow, that an operation has not been considered advisable. There is no operation in surgery which so thoroughly requires the consent and assistance of the patient himself, and as neither of these essential points can be expected in early life, all manual interference must of necessity be delayed until the patient's good sense and courage shall be such as to bear him through the various steps of the operation, which, even in its simplest form, requires a large share of heroic indifference on the part of the sufferer. I have operated on one occasion on a boy only eleven years old, who behaved admirably; but, in general, up to the period of puberty, there is a reluctance to submit quietly to any surgical interference.

In a large proportion of cases of cleft palate, the fissure implicates a portion of the bones as well as the soft velum. Such cases are never so favourable for an operation as when the soft parts alone are involved. When the bones are defective, the soft margins are usually narrow, the gap being wide in proportion, and invariably the muscular movements of the flaps are more conspicuous than when the fissure is limited to the soft velum. In the natural state of the palate the muscular movements are not so remarkable as in the abnormal condition. I do not think that either the levators or palato-pharyngei act with such energy as in the cleft state, and the greater the cleft, I am disposed to say, the greater is the muscular action. This does not depend upon increase of muscular fibres, but rather arises from the comparative mobility of the parts. The smaller the fissure, then, the less conspicuous are the muscular actions—the nearer the normal state, the greater the resemblance in action to the ordinary muscular movements.

When I first drew attention to the anatomy of the cleft palate, and pointed out the motor powers likely to prevent the success of the ordinary operation of staphyloraphy, I was chiefly anxious to point out how and where the muscles of the palate might be divided for the purpose of ensuring that state of quiescence which appeared so necessary to secure union in the mesial line. I wished to put the operation on that scientific basis which characterises the modern operations for club foot, bent knee, strabismus, &c. Although fully satisfied of the correctness of my views, I have occasionally had difficulty in explaining why there

¹ Practical Surgery, 2nd ed. p. 531.

should be movement in the flaps after the incisions requisite for the division of the muscles in question had been made. At first I was puzzled on this point, but I believe that I now understand the cause. It generally happens, even after the supposed division of the levator muscles, that considerable jerking in the flaps may be observed, and such movements I have no doubt are produced by the palato-pharyngei. Supposing the two pillars of the pharynx divided, the portions of these muscles in front may yet vary in length according to their contraction or relaxation; and if their anterior extremities still remain in connection with the posterior margin of the hard palate, the action may be sufficiently vigorous to give the impression, as the parts are looked at, that little good has resulted from the preliminary incisions. If, however, the parts be seized with the forceps, and pulled towards the mesial line, the comparatively feeble influence which the muscles now exert will be very striking. Besides averting muscular spasm, the incision which I recommend possesses another advantage, which I did not insist upon so much in my first paper as it seems to deserve. While the parts are stretched across the roof of the mouth after the insertion of the stitches, the wound above is made to gape, and in this condition is covered with a layer of lymph, which has the effect of thickening the tissues for the time, and also keeping them more quiet than they would otherwise be. I have such confidence in the accuracy of this view, that I prefer a free incision in the site of the levator palati rather than a short wound little broader than the blade; and I recommend the free incision, too, because many of the fibres of the palato-pharyngeus muscle will be cut, whereby further relaxation will be permitted. The incision may be effected either with a free division of the mucous membrane, or the knife may be plunged through this membrane, and then carried backwards and forwards to effect the division of the tissues within. I have sometimes acted on this latter plan, but in my opinion it is best to make the opening in the mucous membrane as free (or nearly so) as the wound in the muscular tissues. The blood gets readily away, and there is no infiltration of it in the soft tissues, as happens when the membrane is left almost entire. In general I find that if the preliminary division above the palate be made free, and in an especial manner the anterior extremity of the palato-pharyngeus be separated partially or perhaps completely from the posterior border of the hard palate, there is little need for the division of the posterior pillar of the fauces. There is perhaps little or no risk in dividing this part, but after doing so, I have usually noticed that the two sides of the uvula became more oedematous than on other occasions, probably from defective circulation through the veins. In some instances, however, the division of that part of the palato-pharyngeus which forms the posterior pillar of the fauces greatly facilitates the approximation of the sides of the posterior extremity of the fissure, and in all instances when, notwithstanding any incisions that may have already been made above each flap, the muscular action of the part seems still vigorous, I should deem the division of the parts in question of great service.

It has often appeared to me that when the head was thrown far back for the purpose of exposing the palate to a strong light, the flaps have

been drawn towards the posterior nares, and that in the same instances when the head was not kept so far back, the parts naturally came nearer the tongue. To account for these circumstances, I am disposed to think that when the head is thrown far back, the axis of the muscle is changed, and that its action, instead of being downwards, is probably upwards, just as the sterno-mastoid muscles are understood to incline the head forwards or backwards, according to the angle which the base of the skull forms with the top of the spine. Anywise I have not found it advantageous during the operation to stretch the head very far back.

In cutting so near to the numerous large vessels which are in this vicinity, some danger from hæmorrhage might be apprehended. I have never yet, however, had the least trouble on this score. I have always used iced water in my operations, and the bleeding, which has never amounted to a table-spoonful, has invariably ceased before the termination of the operation. There might be imminent danger if the knife were carried far back above the palate, but so long as it is limited in its action between the posterior nares and the posterior border of the levator palati, there is no possibility of reaching any large vessel. Further back than this there might be a risk of the point passing out at the side of the upper part of the pharynx, and doing serious mischief.

I still retain the opinion that there is no better mode of introducing the stitches than by means of a slightly-curved needle, set in a handle.¹ The point of the instrument, armed with a smooth round waxed silk thread, is passed from below upwards about a quarter of an inch from the cut margin of the fissure, and made to appear in the middle of the gap, when the thread is seized with forceps, drawn three or four inches out of the mouth, and then the needle is withdrawn. A similar manœuvre is followed on the opposite side; the two threads are then tied together by the ends which have thus been drawn out at the mouth, and, by withdrawing one of them, the other will be carried through the aperture opposite to that where it was first introduced. Hitherto the thread has been double; now one end must be drawn through the apertures and out at the mouth, and so the thread is ready to be tied. Two, three, four or five threads are introduced in this way, and then after the cut margins of the flaps are sponged free of blood and mucus, the various threads are fastened.

In my early operations I generally made a simple knot; or, by turning the thread twice over, made that called the "surgeon's," in accordance with the advice of Professor Smith of Maryland. The object of the double turn is to prevent slipping until the completion of the knot. If there be no great muscular spasm, there is seldom any trouble from slipping; if there should be, the twist first made must be held firm with the point of the forceps, or else a favourable opportunity, whilst the parts are very quiet, must be taken to effect the manœuvre. But in preference to such plans I have latterly adopted a method which I have found to be most satisfactory. A loop is made with a single turn of one end of the thread,² the other end is then passed through it, when

¹ Practical Surgery, 2nd ed. p. 33.

² Druiitt's Vade Mecum, 4th ed. p. 401; also Medical Times, vol. xvi.

it is drawn so tight as just to permit the thread within it to slip along on the application of moderate traction. The loop can now be slid up to one of the apertures in the palate, and the cut edges being accurately adjusted, the whole can be kept *in situ* by tying a common knot on the thread close upon the loop. By taking care that the thread is very smooth on the surface, and regular in size, and by drawing the loop with proper firmness, slipping will rarely occur. But, indeed, it is one of the advantages attending my mode of operation, that there is less trouble at this part of the proceeding, than when the muscles are left entire in their natural condition.

The degree of tightness to which the stitches may be drawn, has often been a puzzling point with me. It has been remarked, that ulcerations frequently take place in the site of the ligatures; and this has been attributed to their tightness. I have no doubt that this is the cause; but if the pressure do not actually strangle the parts, I believe that no permanent harm will result. If the edges of the fissure are not kept together with some degree of firmness, there is a risk of saliva, or mucus, getting between and preventing union. On the other hand, if all the threads were drawn so as to endanger strangulation, the whole extent of the margins between the threads might slough. On the whole, a moderate degree of tightness should be preferred, rather than that the edges should be kept asunder by saliva or mucus. I have, too, had difficulty in determining the time to remove the stitches. In some of my early operations they were all taken away about the forty-eighth or fiftieth hour, but latterly I have permitted them to remain longer. I believe that the adhesions are so readily broken on the second or third day, that it is best to permit all, or at any rate the most important ligatures, to remain over those dates, in case of any dangerous force being applied at this important period. It is better, in my opinion, to let the threads remain several days too long, than that they should be moved a minute too early. Usually I take one or two stitches away on the third or fourth day, and on the fifth or sixth remove them all. It is better, I think, to take them out at intervals, than all at once.

With some exceptions, at first, all my patients have had fluid food from the date of the operation until the union has been firm. I believe this to be a great improvement in the treatment of such cases; and have to express my acknowledgments to my friend Sir Philip Crampton¹ for breaking the established rule, previously acted upon, of starving the unhappy patients for eight-and-forty-hours, or more, after the performance of the operation. Sir Philip permitted two of his patients to partake of "boiled bread and milk, custard, soup, and jelly, twice or thrice a day," with the best possible results; and when I contrast the apparent distress of the patients who were formerly starved, with the comparative comfort of those to whom this wholesome mode of enjoyment has been permitted, I have no hesitation in recommending this treatment as of very great service. Besides, the exhibition of soft or fluid food is less hazardous in my own method than in the ordinary operation, as the chances of spasm and consequent

¹ Dublin Journal of Medical Science, 1st July, 1843, vol. xxii.

dragging in the stitches are greatly arrested. Well made gruel is what I chiefly recommend, and it may be seasoned with salt, sugar, or a little wine, as the patient may choose. Usually, in eight or ten days the union of parts is so firm that solid food may be permitted, and it is seldom that any surgical interference is requisite after that time.

Patients and their friends are generally most anxious regarding the change of voice and improvement in articulation as soon as speech is permitted. If the whole cleft has been closed by the operation, the improvement in tone is at once perceptible; but if there be any aperture left, as is often the case, little change can be perceived. If, however, the opening be closed by any piece of mechanism, the result as regards the voice will appear much the same as in the other instance. In some the change is much more apparent than in others; but in all, considerable after-training is required to improve the voice and speech. The original defect has permitted the air to pass as readily through the nostrils as by the mouth; hence the nasal sound so characteristic of such cases, and hence, too, the impossibility of articulating such sounds and words as get their modulation in the front part of the mouth in the natural state of the palate. I have found some of those on whom I have operated, so very indolent and regardless of improvement, that they have not taken any pains to learn the use of the parts as altered by the operation; but in others there has been such satisfactory progress as to astonish and delight the friends. One of my patients, whose articulation was so bad before the operation that I could scarcely understand a word he said, afterwards set himself industriously to study elocution, and in less than twelvemonths acquired such mastery, that his speech was in reality more correct than is usually heard in ordinary society. The power of speech is acquired so slowly and imperceptibly in early life, that we hardly appreciate the needful efforts; and under the circumstances referred to, we are all perhaps too sanguine as to the expected improvement,—forgetting, in our zeal, the many years that passed in early life ere an ordinary command was obtained over the organs of speech. In most instances I believe that considerable effort is required on the part of the patient to reap the full benefit of a successful operation.

I have attempted on several occasions to close the fissure in the hard palate, in accordance with the directions of my friend Dr. J. M. Warren¹, but as yet without much success. The plan of dissecting the soft tissues from the bones, as recommended by this ingenious surgeon, seems in his hands to have been very successful. My own failures must, I suppose, be attributed to want of skill on my part, or to the circumstance, that the cases in which I have hitherto tried the practice have not been favourable for its application. Sometimes, whilst dealing with the soft palate, I have also dissected the tissues from the bone between the margins of the gap and the alveolar ridges, and so have been enabled to close the whole gap by bringing the parts together in the mesial line; but almost invariably the junction in front has

¹ New England Quarterly Journal of Med. and Surg. April 1843.

given way in a day or two after the stitches have been withdrawn, seemingly in consequence of the contraction induced by the soft structures resuming their original attachment to the bones. Sometimes a small slough has formed in this locality, but I have not perceived that the opening has been larger on this account after the parts had been completely healed; the size of the fissure here being regulated chiefly by the deficiency of the bones.

(To be concluded in next number.)

THE HISTORIES OF TWO CASES OF CEREBRAL APOPLEXY IN CHILDHOOD;

WITH SOME GENERAL AND STATISTICAL OBSERVATIONS ON THE CAUSES OF THE DISEASE, AND THE RELATIVE FREQUENCY OF ITS OCCURRENCE AT DIFFERENT PERIODS OF LIFE.

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THE histories of the two following cases of cerebral apoplexy, occurring in childhood, are offered as a contribution to the records of similar cases. Both of these cases presented well-marked and characteristic symptoms, and, at the same time, striking contrasts, not only in the condition of the patients in whom the attacks occurred, but also in the seat of the hæmorrhagic effusion. One of the subjects was an apparently healthy boy, who was suddenly seized whilst at play; in this case the hæmorrhage was found to be in the substance of the brain. The other was an unhealthy girl, who had long been delicate: here the blood was found effused in the arachnoid cavity. In the first case, hypertrophy of the heart existed, and the hæmorrhage was of the sthenic form; in the other, the patient was suffering from purpura, and the hæmorrhage was of the passive or cachectic kind.

This variety of circumstances has led to a series of reflections, which will be found in the following pages. They include some observations on the causes of apoplexy in general, more particularly in reference to the histories of these two cases. Some remarks on the occurrence of apoplexy at this early age, with references to several similar cases, will be given; and a series of statistical facts, which appear sufficient to prove apoplexy to be a disease of middle life rather than that of advanced age, will be appended.

CASE 1,—Cerebral Apoplexy in a boy aged nine years, characterized by coma, convulsions, and paralysis. Death in seven hours. Large clot of blood in the right hemisphere of the brain. Hypertrophy of the left ventricle of the heart.

Thomas Smith, aged nine years, a boy of slight conformation, but who is stated to have enjoyed good health up to the time of the present attack, was brought into University College Hospital in a state of insensibility. On inquiry, I ascertained that, between three and four hours previously, he had been trundling a hoop, when he was seen to stop suddenly, put his hand to his head, and fall to the ground, making