CLEFT PALATE AND HARE-LIP.*

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Cleft palate fortunately is not a very frequent deformity; still, according to the most reliable statistics, one child in every eighteen hundred has some deformity of lip or palate.

Cleft palate is usually, but not universally, complicated by a fissure of the lip, which may be simple or double, complete or incomplete. Such deformity may be a slight central defect in the intermaxillary bone, with a small notch in the lip. A bifurcated uvula, or any degree between these slight defects, to one including all of the soft and hard palate and dental arch; with a projecting or in rare cases the complete absence of the intermaxillary bone. The skin of the lip may be united when the muscles are not. The cleft of the hard palate may be simple or double; if double the space is divided by the Vomer. A double cleft is not, of necessity, more difficult to close than a wide unilateral one.

I believe that Broca, Albrect and Czerny are justified in holding that the hare-lip fissure does not usually, as is generally held, pass outside of the incisor teeth, but between the central and the lateral incisors. An incisor may be wanting and the cleft appear to be next the cuspid. Occasionally, there may be supernumary incisors. Normally, the intermaxillary bone carries only the central incisors. When the fissure does pass between the lateral incisor and the cuspid it will be found that the nasal cavity is not opened. We may have a cleft of either the soft or the hard palate alone; either one with or without the hare-lip. A cleft due to disease may be of almost any extent. At this point consider the facial clefts for a minute. I shall deal only with the congenital clefts.

Although not frequent, cleft palate is probably quite as often met with as is any congenital deformity of equal importance to the individual. If not operated on, it is a constant reminder of defect, which must to a great extent change the disposition and general mental development of the child. An obturator, no matter how perfect it may be, does not obliterate the deformity; simply substitutes a mechanical for a natural part. Surgical measures may almost if not entirely obliterate the defect and the child forget it. It

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is for this reason that I urge that we resort to prothesis only after it is proven that surgery is of no avail. This will leave but few cases for an obturator, but in these few it is of inestimable value, and it is well that such useful ones were made before the surgical treatment advanced to its present even though imperfect stage.

Each individual experience has more or less determined the time and methods suited to secure the desired results with the least mortality. Different times and methods result differently in the hands of different operators. To a certain extent, each individual case is a law unto itself. Much depends on the general health of the patient and the extent of the deformity. If it prevents the proper nourishment of the child the deformity should be completely or partially corrected at the very earliest possible age; while delay even to adult life in some cases may be desirable. One surgeon claims success only if the operation be performed before the child learns to speak; another selects five to seven years as the most appropriate time; another after second dentition, after puberty. Still others say have the full co-operation of the patient—no matter at what age that may be. Some operate the day of birth on the lip, if not on lip and palate both. I find reported a successful operation for hare-lip and cleft palate on a child seven days old and one by Wolff on a man of fifty-two. Doubtless successful cases could be found at almost any age between these extremes. The earlier surgeons seldom attempted the operation in infancy. Many who formerly operated late now select the earliest time consistent with the general condition of the child. Others always advise mechanical appliances for all except the very slight deformities. Formerly Fillebrown of Boston, and others, gave preference to the obturator; while at present they decide for operation.

Success must include at least two things. Success surgically is of great importance, for without this we can not hope for perfect speech, which is of great importance, as it is speech like his fellow-men that makes much for the development of the individual. This, you say, may be accomplished by prothesis. True it may be, but it does not remove the deformity, which is an ever present annoyance. Many a child does not speak distinctly even with a perfect palate. Defective speech is incident to many conditions other than cleft palate and hare-lip, so we must not be disappointed if perfect speech does not result after correction in this cause. Eliminate all causes as far as possible, and do not neglect the training, both before and after the operation.

In favor of early operation is given: Child more easily nourished; perfect speech more likely to result; palative arch not so high and more accessible; little or no anesthetic required; hemorrhage in young children always slight; elevation of mucous membrane and perichondrium easy; vitality of flaps distinctly greater; and union between surfaces much more apt to take place. Osteoclasis must be done under four years of age. Later the bones can not safely be forced together. A partial closure tends to narrow the remaining cleft.

In favor of late operation, the argument is that one has full cooperation of the patient; the tissues are stronger and better nourished; nutrition of the teeth not so likely to be interfered with. If the hare-lip has been closed early the cleft in the palate will be much

Fig. 1. Gutta Serena Plate worn before Operation and during Healing.

diminished. Early uranoplasty interferes with the complete development of the skeleton of the arch. There is much greater mortality under eighteen months. A. Jacobi is quoted as saying that tissues of the palate can not be operated on until the child is four or five years old, but that unless there be strong contraindications, the hare-lip should be operated on the first day of life when the immediate necessity of feeding is not urgent. If the cleft in the lip and palate is not to be closed at one sitting, but within a few weeks or months of each other, it is well to take the palate first on account of the added room and better view. If one must be left for years, operate on the lip first. At the present time the general opinion seems to be in favor of at least moderately early surgical treatment. Neglected cases will occasionally present themselves and advanced years alone will seldom bar surgical treatment.

In 1879 W. Fairlie Clarke writes: "If there is a large gap, the patient must be content to wear an artificial palate. The soft palate may in some cases be united and a plate used to fill in the hard palate." Another author says "that if mechanical closure is decided upon it is no good to unite the velum as it will of necessity have to be split open to make an obturator do its best work."

An obturator is not practical until after second dentition on account of imperfect anchorage and the necessity for frequent changes. The average time during which a Tubbs velum retains its usefulness is sixteen months. The worst record is four vela in two years; while the best is three in five years. The majority use about one velum a year. In 1881 Baker made his first successful appliance. As late as 1892 very pessimistic views of the surgical treatment of cleft palate were presented by those who preferred Kingsley's obturators and by others who gave preference to Svensen's appliances. Prothesis has been very thoroughly advocated, but the writers have entirely lost sight of the achievements of modern plastic surgery in the hands of many operators who have obtained ideal results. Price of Ann Arbor describes a method of reducing the cleft by means of a plate and spring.

Operation being decided on, where and how shall we secure sufficient tissue to close the space without tension. In children under four years of age, osteoclasis of one sort or another may be selected. I have seen severe shock and almost immediate death follow osteoclasis. It does not give superior results; often several operations being necessary. This operation requires much courage in one's convictions. For any operation the patient must be in good general condition and, when practical, should have some previous training and treatment. In some cases, if the patient is standing the operation well and there is not much loss of blood, the lip, hard and soft palate may all be closed at one time. It is good judgment not to extend the operation over too long a time, no matter what the immediate condition may be, as an unusual amount of shock often results. Wolff and others often operate in two stages. First mark out and elevate the flaps and leave them four days to control hemorrhage and improve nutrition. Wolff claims that the greatest mortality under eighteen months of age would be much lessened were more care taken to avoid loss of blood. Flap tissue has been and may be obtained according to the individual demands, from the remaining portion of the palate; the septum nasi, the inferior turbinal, the posterior wall of the pharynx, the side of the tongue, the forehead, lip

or cheek. That from the palate or septum is most frequently used. The flaps may be cut and manipulated in various ways. Make an incision parallel to the cleft, near the alveolar border through mucous membrane and perichondrium and through this elevate to the edge of the cleft, and well around the edge, especially at the junction of hard and soft palate, as by remembering this myotomy to give relaxation is almost invariably avoided. Freshen the edges of the cleft, slide over the flaps and unite the freshened edges with silk,

Cast No. 1. Hard Palate showing Cleft.

silk-worm gut, horse hair or silver wire—colored sutures are a great convenience. By using a slip knot first the edges are more easily adjusted and the knot is fixed by shot or a square knot. Sutures must be very close together, especially in the soft palate and uvula. A flap consisting of mucous membrane and perichondrium may all be taken from one side. Make an incision parallel to the edge of the cleft just within the alveolar border and dissect free to and around the free border, which is used as a hinge on which the flap, after being divided at the ends, is turned directly over, bringing the per-

condryl surface into the mouth. The free edge of this flap is then sutured between the split edge of the opposite side of the cleft. This method is much better adapted to the hard than to the soft palate. Parkhill uses a triangular flap, the apex on one side being front and on the other back. The flaps are elevated and slide over to the median line, where the freshened edges are sutured in the usual way. Another suggestion for flaps is to mark out a triangle on each side, the base being the edge of the cleft and the apex an imaginary point beyond the second molar tooth. The two sides of the triangle are connected just inside the alveolar ridge by an incision through the mucous membrane and perichondrium. Through this the tissues are elevated to and around the cleft. The ends are not divided, but the tissues slid over and in the median line united in the usual way.

Murray of Liverpool uses a button suture to bring up the flattened ala. For the same, Wyeth of New York advances the anterior portion of the upper jaw on the short side and secures it with silver wire sutures. He does this six to eight weeks before commencing work on the other parts.

M. Roux, in 1819, made the first successful operation for cleft palate. This included only the velum and uvula. J. Mason Warren of Boston was the first to devise an operation for cure of fissure of the hard palate, first published in 1843. Warren was also first to suggest dividing the muscles to relieve tension. Roux employed transverse incisions, for which Dieffenbach substituted incisions parallel to the fissure. I have gone over the literature quite thoroughly and wish to give due credit for all suggestions which have in any way contributed to the present, though perhaps still imperfect methods of treatment. After dentition the proper occlusion of the upper and lower teeth is of much importance. For feeding before or after operation a nipple with soft rubber wings, and the opening on the under side in place of the end may be used. Peck suggests a sounding board as a valuable aid in teaching a child to talk. One case of severe secondary hemorrhage is reported, caused by the child picking at the sutures. A few turns of plaster bandage will control the arms, or that which is better is a pair of small, straight sleeves, which prevent flexion at the elbow, but leaves free action of the shoulder joint.

The difficulties are many and even the slight defects require study, patience and surgical skill. Not in every case will good union along the full length of cleft be secured with the first operation. If a

stitch gives out, as soon as possible introduce another. Sutures in the lip should be removed the second or third day, and tension prevented by the use of adhesive plaster. In the hard or soft palate they may remain weeks if they are not cutting, and should be removed only one or two at a time. When necessary a relaxation suture may be introduced several days after the primary operation. Any point not inclined to close may be stimulated with nitrate of silver, compound tincture of benzoin or tincture of cantharides. Keep the parts as clean as possible by frequent douches. Prevent

Cast No. 2. Showing Results obtained after Operation.

talking. Feed with liquids or semi-liquids and in extreme cases by rectum. Keep the patient out of doors as much as possible.

The case I wish specially to report is that of Robert C., thirteen years and nine months old. A country boy somewhat under size. The cleft in the lip, which had been repaired when he was seven months old, must have been quite extensive, judging from the scar, which extended at the base of the lip nearly the full width of the nose, with a much puckered one at right angle to this, which drew

the middle of the lip under the left ala. This diminished the flexibility of the lip to such an extent that he moved it very little. Three teeth were missing and a wide triangular gap in the dental arch opened the left side of the nose, which cavity was one with the mouth, the hard and soft palate being completely divided. The septum, which was displaced to the right anteriorly, extended to and was united to the pharynx, dividing it into two distinct cavities, the left being one with the nose and mouth. An abnormally developed cartilage just inside the left vestibule enabled him to completely close that side of the nose when swallowing. The right vestibule was three-fourths closed by the deflected and thickened cartilage. The nasal and pharyngeal tissues were covered with crusts and purulent secretion. Hearing was very deficient, both ears being filled with necrosed epithelium, pus and granulation tissues. The nasal and oral secretion were very offensive. The upper jaw was broad and flat, the under jaw projecting much in front of it. He had long, bushy, red hair and wore a heavy, squeaky iron brace on the right leg and foot, they having been badly crushed by a railroad train when he was seven years old. Robert's was an exceptional case, for with all this handicap he had a sunny disposition and a mental development quite beyond the average boy of his age. Had it not been for this and the fact that he had received careful home training and was ready to assist me in every way possible, it would have been very hard to spend with him the time necessary even to hope for results.

For four months we devoted the time to all-around cleansing and disinfecting. During this time, I had this plate made so as to freely escape the roof of the mouth, as we hoped to have it after operation.

He became accustomed to it and was able to eat much better with than without it.

Cast No. 1 shows the condition of the mouth April 12, 1905, when under general anesthesia, produced by ether and continued with chloroform, with Wolff's instruments, I did a plastic operation, including the soft and all of the hard palate, except a small part anteriorly, which, if included, would have endangered the nutrition of the flaps. At the same time, I cut through the extension of the septum. The flaps were obtained from the palate and septum, the tissue being dissected free from a line just inside the alveolar ridge to and around the edge of the cleft on the left side and well up on the septum on the right. By means of the previously adjust-

ed plate, I was able to hold an antiseptic dressing in contact with the wound and at the same time protect it from the tongue and food.

There was quite free bleeding at times during the operation, but the boy was put to bed in good condition. Two hours later I was told over the telephone that there was some bleeding. I gave instructions and made ready to return to the hospital, when another report made me go at once. I found the patient in a very critical condition, no radial pulse and the lips and ears absolutely blanched. I quickly drew some packing up behind the palate and met it with some through the left side of the nose. This promptly stopped the bleeding. Tincture of iron, strychnine, hypodermoclysis, and at the same time normal saline solution and bovine by the bowel saved my boy. The resident surgeon had gone immediately to another operation, leaving the case with a nurse not alive to conditions. For several days we gave bovine by the bowel every four to six hours in addition to all the liquid and semi-liquid nourishment we could administer by mouth. The nose and mouth were thoroughly and frequently cleansed. For two weeks he spoke but once. At the end of that time he left the hospital and came to the office for treatment. Several times I did a little patching, which with stimulation gave complete union the full extent of the operation. Never despair! If a stitch gives out put in another, and put them very close together at first, especially in the soft palate and uvula. At one time, I thought it had entirely gone to smash, and the operation would have resulted in almost complete failure had I not at once gathered courage to put in new stitches.

Robert went home the first of July and returned December 4, much improved by his country outing. I now devoted my efforts especially to the ears, giving the teeth and jaws over to Dr. Aliee M. Norton, the dentist who had made the protecting plate. Dr. Norton gave much time and thought to the work and by various mechanical appliances was able to bring forward the upper and push back the lower jaw until the teeth occluded, and then put in a strong heavy bridge, carrying three teeth. The bridge and the change in the jaw closed the remaining part of the cleft and probably much better than I could have done at the time of the primary operation. My only regret is that I did not have the dental work done first. I thoroughly believe that after second dentition it would be wise first to put the patient in the hands of a good dentist accustomed to regulating and have the jaws brought into as nearly normal relation to each other as is possible, and held by some me-

chanical device until there is no danger of recurrence of the deformity. It will in many cases greatly diminish the cleft and improve the general condition of the mouth.

One stage of the dental work came near proving disastrous to the new tissue of the hard palate. Had the tension been exerted a few hours longer in one direction it would have completely opened the hard palate. I shall never again let the dental work come second, as so very much depends upon it. The discharge from the ears entirely stopped and he has about three-fourths normal hearing. The nasal discharge continued to some extent when he finally left town. The flexibility of the lip was much improved by dividing the puckered scar with the knife and the transverse one with the electric needle. The right vestibule was well opened by dissecting out the cartilage. Unfortunately, the suture holding the left ala in place gave out prematurely, and I did not consider it wise to operate again at that time. He bore perfectly well all the work on the palate and the regulating, but the instant I commenced work at the naso labial junctivi he became very faint, with irregular heart action and the radial pulse very weak or entirely absent. The heart gradually recovered itself, but he felt badly for several hours. The needling of the scar at the base of the lip had the same effect, so that I was able to do but very little at one sitting. I find one similar case reported where work at this point caused irregular heart action. Had we been working under a general anesthetic, what would have been the result? Robert developed very rapidly the last six months he was under treatment and the nervous strain from the regulating was considerable. In a few years he may be able to stand having the nose brought up into better shape. He went home June 14 with the mouth in the condition shown by the last cast.

He was able to speak so that any one was able to understand him. He was readily understood over the telephone.

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