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Da Costa

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Modern Surgery - Chapter 26. Diseases and Injuries of the Upper Digestive Tract

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XXVI. DISEASES AND INJURIES OF THE UPPER DIGESTIVE TRACT.

Injuries and Diseases of the Face, Nose, Mouth, Salivary Glands, Tongue, Jaws, and Esophagus.—**Wounds of the Salivary Glands.**—An aseptic wound usually heals and rarely results in a salivary fistula, although after healing it is not unusual for an encysted collection of saliva to gather under the skin. Such a collection of saliva, if it does not disappear spontaneously, can usually be gotten rid of by continued pressure. When a wound of a salivary gland is infected, a single fistula or multiple fistulae may be left as a legacy. A salivary fistula is very annoying, because the saliva flows constantly. A fistula usually heals spontaneously after a long time, but healing can be quickly brought about by touching the orifice with the Paquelin cautery.

Wound of Steno's duct is apt to cause a fistula, and the condition is often difficult to cure. In this condition, when the duct was cut across, the central end grows fast to the cutaneous surface. Fistula of Steno's duct may also be caused by obstruction and rupture of the duct and by suppurative or gangrenous processes.

In wounds of the duct the ends should be brought as near together as possible with catgut sutures which do not enter the lumen of the duct; an incision should be made through the mucous membrane to permit drainage of saliva, if the mucous membrane is not already opened, and the skin should be sutured. In some cases the central end of the duct may be carried into the mouth and sutured to the mucous membrane. If, after an injury of Steno's duct, saliva gathers under the skin, make an incision through the mucous membrane, to give a route for the saliva to enter the mouth, and apply pressure externally. When a fistula forms, it may be cured by the cautery and pressure, but, if the peripheral portion of the duct is obliterated, which can

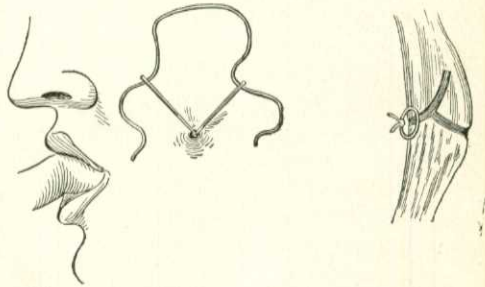


Fig. 349.—De Guise's operation for salivary fistula (Esmarch and Kowalzig)

be determined with a sound, an operation must be performed. Tillmanns advocates cutting out the external portion of the fistula by two elliptical incisions. A trocar is passed through the bottom of the wound in two places, about half a centimeter apart; a piece of stout silk is drawn through the holes and tied tightly and the superficial incision is closed. The silk cuts through and makes an internal fistula. Another method is to make an incision, find and isolate the central end of the duct, open the mucous membrane, suture the duct to it, and close the superficial wound.

De Guise's operation is shown in Fig. 349. He threads a piece of silk through two needles and carries the needles into the mouth so that the silk will embrace a bit of tissue half a centimeter in length. The silk is tied tightly

within the mouth, the ends are cut off, and the margins of the fistula at the surface are freshened and sutured.

Parotitis.—Mumps, or epidemic parotiditis, is treated by the physician. In this condition the submaxillary and sublingual glands are usually involved as well as the parotid. In pyemia metastatic abscesses may form in the parotid gland. Great swelling arises, respiration is often embarrassed, and early incision is necessary. Parotid inflammation other than mumps is usually due to the passage of bacteria up Steno's duct, the source of the microbes being a foul condition of the mouth, particularly noma or stomatitis. Hence, such inflammation is most common during the existence of acute infectious diseases and sepsis. Suppuration or even gangrene may occur. As a rule only one gland is attacked, but both may be. It is a well-known fact that occasionally, after an abdominal operation, non-suppurative inflammation of the parotid gland occurs. In non-suppurative parotitis there is pain, tenderness, obvious swelling, and hyperemia of the skin, and it is difficult to open the mouth or swallow. When suppuration occurs, all of the above symptoms are intensified, the discoloration becomes dusky, the skin becomes shiny and edematous, the constitutional symptoms of pus-formation exist, and there is usually delirium.

Treatment.—In the non-suppurative form apply an ice-bag over the gland for the first twenty-four hours and then substitute heat. Wash the mouth out frequently with an antiseptic wash and apply ichthyol and lanolin to the swollen region. In the suppurative form make several openings by Hilton's method, seeking for points of softening; apply hot antiseptic fomentations, wash the mouth frequently with an antiseptic fluid, and combat sepsis by appropriate constitutional treatment.

Salivary Concretions.—The saliva contains in solution certain salts which may deposit. Deposited on the teeth they constitute tartar. Deposited in a salivary duct or the acini of a gland they constitute a calculus. The salts deposited are carbonate and phosphate of lime. A calculus may consist purely of these two salts or there may be a foreign body nucleus. A calculus is a possible result of an inflammation which blocks, constricts, or roughens a duct or acinus and decomposes saliva. Small concretions are often passed. Concretions the size of a bean are retained. A concretion may attain the size of an English walnut. A concretion does not block a duct continuously, but does so now and then, causing swelling and tenderness of the gland. A retained calculus can be palpated by a finger in the mouth and a finger externally.

Treatment.—A calculus in a duct is extracted by making an incision through the mucous membrane. If a very large calculus forms in the submaxillary gland, the gland should be removed through an external incision.

Harelip and Cleft Palate.—*Harelip* is a congenital cleft in the upper lip due to defective development. *Cleft palate* is a congenital fissure in the soft palate or in both the hard and soft palates. In harelip the cleft is usually complete, through the entire lip into the nostril, but in rare case it may only show as a furrow in the mucous edge or as a split from the nostril partly into the lip. It is most common on the left side. In double harelip the central portion of the lip is often adherent to the tip of the nose. Double harelip may be free from complication, but is often associated with a malformation of the alveolus and palate. Median harelip is exceedingly rare. In cleft

palate the septum of the nose is usually adherent to the palatine process opposite the side upon which the fissure exists. In those rare cases of cleft palate double in front, the nasal septum is attached only to the premaxillary bone, and the premaxillary is not attached at all to the superior maxillary bone. In harelip there is frequently a cleft in the alveolus, and almost always flattening of the corresponding side of the nose. Harelip is often associated with cleft palate, talipes, and other deformities. It is a great deformity, and interferes with sucking, swallowing, and articulation.

Operation for harelip should be performed between the third and sixth months of life in a child in good health, free from stomach trouble, cough, or coryza, but operation is not advisable in the early weeks of life. Always, if possible, operate before dentition begins (seventh month). If the child is in poor health, postpone the operation until restoration has so far advanced as to render operation safe. While waiting for operation be sure the child is getting enough food. If it cannot suck, feed it with a spoon. If a cleft exists in the palate, operate first upon the lip, because the pressure of the parts after the edges of the gap are approximated aids in the closure of the bony cleft. Cleft palate interferes with sucking, deglutition, mastication, and articulation. In severe cases the food passes into the nose and excites inflammation. Loss of control of the palate-muscles always exists, and liquids and solids are liable to pass into the windpipe. Clefts in the hard palate should not be operated on until the second year, but should be operated upon then, otherwise speech will be permanently affected. Some surgeons refuse to operate until the tenth or twelfth year, but operation done this late will not correct speech-defect (Edmund Owen). The patient at the period of operation should be well and free from cough. In many cases the passage of food and drink into the nose can largely be prevented by the use of a diaphragm.

Operation for Harelip.—The instruments required are a tenotome and scalpel, toothed forceps, hemostatic forceps, scissors curved on the flat and pointed, straight blunt-pointed scissors, needles (straight and curved), silver wire or silk-worm-gut and silk sutures, a mouth-gag and tongue-forceps, a needle-holder, and sequester-forceps, each blade protected by a rubber tube. Wrap the child in a sheet; place it in the Trendelenburg position, and rest the head upon a sand-pillow. The surgeon stands to the right side of the patient. Ether or chloroform is given. For single harelip, separate with the scissors the upper lip from the bone on each side of the cleft until approximation of the cleft can be effected without tension. If the premaxillary bone of one side projects more than its fellow, grasp it with sequester-forceps and bend it back (Jacobson and Treves). Clamp the upper lip at each angle of the mouth to prevent hemorrhage. If the edges are of equal or nearly equal length, and if the gap is not very wide, perform Malgaigne's operation. This is performed as follows: a flap is detached on each side, the detachment beginning at the upper angle of the gap; each flap is detached above but remains attached below. The flaps are separated from the bone, and are drawn downward so as to form a prominence at the vermilion border (Fig. 350). If the edges are pared so that in closure the vermilion border is even, when the parts are healed a gutter will be visible at the line of union. The edges are approximated by an assistant, and silk-worm-gut sutures or silver wires are passed by means of a straight needle. Each suture goes down to the mucous membrane. The first suture

is passed through the middle of the lip, one-third of an inch from the cleft. Three or four main sutures are passed through the thickness of the lip, and are tied and cut off. Two or three fine silk or catgut sutures are passed by a curved needle through the vermilion border of the lip and the mucous membrane of the mouth, and are tied and cut off. A small piece of gauze is placed over the lip and is held in place by straps of rubber plaster. After operation prevent the child crying by feeding it often and giving it small doses of laudanum. Heath orders two drops of laudanum in one ounce of distilled water, a teaspoonful to be given every two or three hours. About the sixth day one-half the sutures are taken out, and on the eighth or ninth day the remaining ones are removed. In many cases no further procedure is necessary, but if after some weeks the prominence at the lip-border does not shrink, it can be readily clipped away. Harelip-pins are not used at the present time, and are not needed if the lip is well separated from the bone. If the edges of the cleft are of unequal length, Edmund Owen's operation can be performed (see below, under Double Harelip), or we can perform Mirault's operation, as shown in Fig. 352.

In double harelip the operation is similar to that for single harelip. If the intervening piece is vertical and is covered with healthy skin, complete each

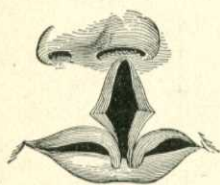


Fig. 350.—Malgaigne's operation for harelip.

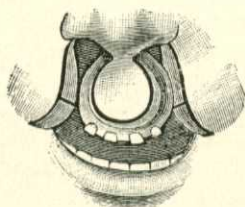


Fig. 351.—Incisions for double harelip (Esmarch and Kowalzig).



Fig. 352.—Mirault's operation for single harelip (Esmarch).

operation as for single harelip, closing both fissures at once with silver wire in a strong, healthy child, closing them at intervals of three weeks in one not so lusty (Fig. 351). Excise the septum if it is deformed. The premaxillary bone should in most instances be removed, the skin over it being preserved. Sir Wm. Fergusson was accustomed to incise the mucous membrane and shell out this bone. The premaxillary bone can be forced back into line, being held, if necessary, by catgut suture of the periosteum; but if saved it is liable to necrose and its teeth soon decay. Heath removes this bone two weeks before operating on the lip. If there is much hemorrhage after removal of the bone, arrest it with a hot wire or with Horsley's wax. Fig. 351 shows incisions for double harelip. Edmund Owen's operation is very useful (Figs. 353, 354). In this operation very thick flaps are cut. The prolabium and incisive bone are removed. The flaps are cut as shown, Fig. 353, on one side by line *ab*, and on the other side by line *cd*, *e* is brought to *e*, *b* is brought to *d*, *f* is brought to *c*, and sutures are applied (Fig. 354).

Operation for Cleft Palate.—It is true that during the early years of growth a cleft diminishes in size; but to wait too long before we operate means permanent speech-impairment. Bony clefts should be operated upon during the second year. Clefts of the soft palate only may be operated upon during the

first six months. If both the hard and soft palates are cleft, close both at one operation. Edmund Owen has recently put forth a convincing plea for early operation.* He says he is operating earlier and earlier, and quotes Chilton as the gentleman who led him to do so. Owen maintains that if speech is to be improved operation must be done early, and he formulates some very valuable rules of preparation and care: Have the child in the best condition, free from cough and stomach disorder. Operate in the summer. Place the child under the charge of a nurse several days before the operation. For *suture of the soft palate (staphylorrhaphy)* Treves says the following instruments are essential: two sharp-pointed tenotomes, a blunt-pointed tenotome, a rectangular knife, two pairs of long forceps (one with tenaculum points, one serrated), a fine hook, a pair of sharp-pointed curved scissors, scissors curved on the flat, periosteum-elevators, two long-handled needles with eyes at their points, a suture-catcher, a tubular needle for wire sutures, hemostatic forceps, Whitehead's gag and retractors, silver wire, silkworm-gut, and sponge-holders; also an electric forehead-light. The patient's body may be raised, with his head elevated and rested upon a sand-bag. A better position is that of Trendelenburg, as it prevents the trickling of blood into the windpipe. Chloroform is given. The

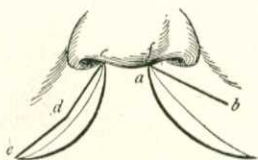


Fig. 353.—Double harelip, the prolabium and incisive bone having been removed (Owen).

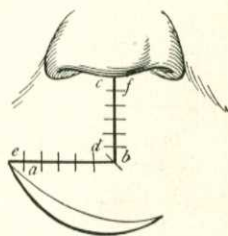


Fig. 354.—The two sides of the lip drawn together and secured by sutures (Owen).

gag is introduced; the edges of the mucous membrane are pared with a tenotome; the sutures are introduced from below upward, silkworm-gut being used for the uvula and lower part of the velum, silver wire for the remainder of the cleft; each suture, as it is passed, is tied or twisted, but is not cut until the next suture is inserted, and serves as a handle. If there is too much tension to allow of the sutures being tied as they are inserted, all the sutures are passed and loosely twisted. A longitudinal incision is made upon each side, internal to the hamular process, the mucous membrane being cut with a sharp tenotome, the deeper structures being divided with a blunt tenotome; the sutures are tied or twisted and cut (Fig. 355). In *Fergusson's operation* for cleft of the hard palate (*uranoplasty*) the mucous edges are pared and the sutures inserted but not tied. Make an incision upon each side down to the bone, the incision being midway between the cleft and the alveolus. Divide the bone on each side, by means of a chisel, to the full length of the incision, and, using the chisel as a lever, force each half of the bone toward the gap. Tie the sutures, and plug each lateral incision with a piece of iodoform gauze (Fig. 356). After the operation for cleft palate put the patient to bed for one week; forbid talking; give fluid or semisolid food at intervals of two or three hours for three weeks;

* Lancet, Jan. 4, 1896.

wash out the mouth very often (always after eating) with a solution of boric acid and listerine or Condy's fluid. Sutures are removed in from two to three weeks.

Edmund Owen* operates as follows: pare a strip of mucous membrane from each side of the fissure from the tip of the uvula to the top of the gap. Make a free incision "along the alveolar aspect of the palate" close to the teeth. Lift up the strips of mucoperiosteum and shift them toward the cleft. Sever the attachments of the soft palate to the posterior border of the hard palate and extend the alveolar incision well backward. This incision relieves tension. Sew up with wire; twist and cut each wire, leaving an end one-eighth of an inch long. This procedure causes the child to keep his tongue from the suture-line. For the first twenty-four hours give only water, and after this period feed with beef-jelly and liquids.

When feeding is begun attempt irrigation or spraying if it does not alarm the child. In a day or two the patient can take sweetened orange-juice, custard-pudding, finely sieved meat or chicken. The best fluid for irrigation is Condy's fluid or mild carbolic acid (Owen).

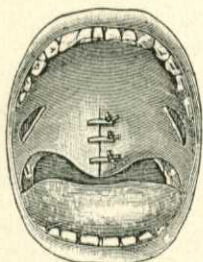


Fig. 355.—Staphylorrhaphy (Esmarch and Kowalzig).

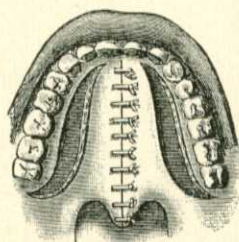


Fig. 356.—Uranoplasty (Esmarch and Kowalzig).

Get the child out in the air a day or two after the operation and keep it out all day. (The entire article of Mr. Owen will well repay a careful reading.)

Carcinoma of the Lower Lip.—Cancer commonly arises in the lower lip, very rarely in the upper lip. Males suffer frequently, but females are not very often attacked. In some cases it seems to arise in smokers at the point on the lip where the pipe habitually rested. A short-stemmed clay pipe, which grows hot when it is smoked, is particularly apt to lead to the growth of cancer. The region of the lip which is most liable to cancer is the junction of the skin and mucous membrane. The growth may begin in a fissure or abrasion, may start in an eczematous area, but most frequently arises as an indurated area which quickly ulcerates. After a cancer has existed for a variable time the submental and submaxillary lymphatic glands become diseased. This involvement cannot be detected by external manipulation in the earliest stages; hence it is not proper to conclude that glandular involvement is absent simply because it cannot be palpated. It occasionally happens that glands enlarge because of septic absorption, and this enlargement may even precede carcinomatous involvement. From an operative point of view the glands should always be regarded as carcinomatous. If cancer is not operated upon, it

* Lancet, Jan. 4, 1896.

destroys the lip, involves the glands of the neck extensively, the floor of the mouth, the periosteum and lower jaw, and produces death in from three to five years. If the jaw is involved, the prognosis is bad, and it is practically hopeless if the floor of the mouth is involved.

Treatment.—The treatment consists in the early and thorough removal of the growth with the knife, and also in the removal of the fatty tissue and glands from the submaxillary triangles and from the submental region. The growth must be thoroughly removed, that is, the incision must be at least half an inch wide of the disease. Thorough early removal will cure about 50 per cent. of cases. For many years a favorite operation has been the V-shaped incision, the skin-edges being sutured by silkworm-gut, the sutures being passed almost to the mucous membrane and being inserted so as to compress the vessels when

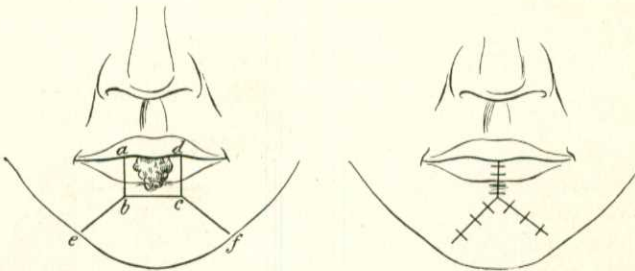


Fig. 357.—Grant's operation for carcinoma of the lip.

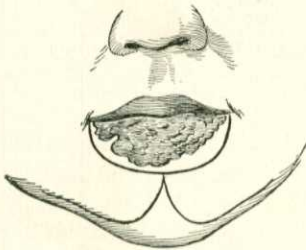


Fig. 358.—Removal of lower lip and cheiloplasty (Esmarch and Kowalzig).

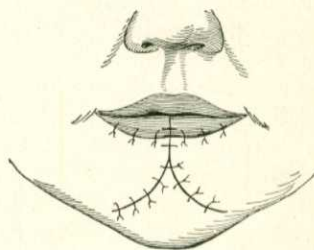


Fig. 359.—Suturing in cheiloplasty (Esmarch and Kowalzig).

tied, and the mucous membrane being sutured with fine silk or catgut. The V-shaped incision should only be used for a small growth. After the removal of the growth from the lip a vertical incision is made from the point of the V over the cricoid cartilage, and from the origin of this incision incisions are made in each direction along the under surface of the body of the jaw. The glandular area is thus exposed, and after the removal of the fat and glands the wound is sutured with silkworm-gut. Better than the V-shaped incision is the method devised by W. W. Grant, of Denver.* In this operation the growth is removed and cheiloplasty is performed. This operation secures a larger, less rigid, and more useful lip than does the older method. In this operation the growth is removed by two perpendicular incisions and a transverse cut (Fig. 357). From each lower angle of the wound an oblique incision is made (Fig.

* Medical Record, May 27, 1899.

357, *b e, c f*), and these incisions, if carried below the jaw, permit the removal of lymph-glands. The flaps are sutured as shown in Fig. 357.

In a case in which the lip is extensively involved the entire lip should be removed and a new lip should be taken from sound tissue and fastened in place. This operation is shown in Figs. 358 and 359.

Tongue-tie is a congenital shortness of the frenum. The tongue cannot be protruded beyond the incisor teeth. Swallowing is interfered with, and later in life articulation is impeded. Treat tongue-tie by tearing up the frenum with the thumb-nail. If this fails, catch the frenum in the slit in the handle of a grooved director, push the director toward the base of the tongue, and nick the frenum with scissors curved on the flat and pointed toward the floor of the mouth. The nick should be nearer to the floor of the mouth than to the tongue.

Ranula is a retention-cyst of the duct of the submaxillary or the duct of the sublingual gland. A ranula when first formed contains saliva, but after a time the saliva undergoes a change, and in appearance comes to resemble mucus. Mucous cysts occur in the floor of the mouth, resulting from obstruction of the ducts of the mucous glands of Nuhn and Blandin. These glands lie on each side of the frenum of the tongue. Such a cyst is often spoken of as a ranula. A ranula appears upon the floor of the mouth on one side and pushes the tongue toward the opposite side. The *treatment* of a mucous cyst is by excision of a portion of the cyst-wall and cauterization of the interior with pure carbolic acid; or by cutting a flap from the cyst-wall and stitching it aside so as to keep a permanent opening. Such an operation may cure a genuine ranula, but will often fail. In true ranula an external incision should be made, and through this both the cyst and the gland should be removed. This plan is recommended by Mintz.*

Thyro-lingual Cysts and Sinuses.—The thyro-lingual duct runs from the base of the tongue, down the mid-line of the neck, back of the hyoid line, to the upper portion of the front surface of the trachea, where it bifurcates, each branch passing to a lateral lobe of the thyroid gland. This fetal structure under normal conditions closes, the foramen cæcum marking its upper end. The duct may persist between its origin and the hyoid bone, developing, it may be, into a *sublingual dermoid*. The portion behind and below the hyoid may remain, and develop into a *subhyoid bursa*. The part inferior to the hyoid may persist, give origin to a cyst which ruptures and constitutes an incomplete *cervical fistula*. The duct may remain open from the mouth and make by bursting an opening in the neck (complete cervical fistula). The small diameter of a cervical fistula renders probing to any depth impossible. To determine if a fistula is complete, inject quassia solution into the lower end, and the patient will experience a bitter taste; or inject a colored fluid which will run from the mouth.

Treatment.—A cyst or dermoid should be dissected out. A fistula requires the complete removal of its epithelial lined walls. No lesser operation will cure. In one case I operated four times before securing success.

Carcinoma of the Tongue.—This is one of the most dreadful forms of cancer. It is quite a common disease. It begins, as a rule, near the tip, on the side or at the base of the anterior two-thirds of the tongue, as an ulcer hav-

* Zeitschrift für Chirurgie, March, 1899.

ing at first a papillary structure, as a fissure which indurates, or as an indurated area which ulcerates. The cause of the growth may sometimes be traced to the irritation of a jagged tooth, or to the smoking of a pipe, or to holding nails in the mouth, as is done by those who nail laths. Cancer may follow a chronic inflammation—leukoplakia, for instance. As in cancer of the lip, men are much more frequently affected than women. In most cases the disease spreads rapidly; produces early and extensive glandular involvement; disease of the floor of the mouth; dribbling of saliva; difficulty in masticating, swallowing, and talking; foulness of the breath; severe pain which usually radiates toward the ear, and often a fatal septic trouble. Cases not operated upon usually die within two years. There is a very rare form of carcinoma described by Wölfler, which grows very slowly or even remains latent for years.

One reason why cancer of the tongue grows so rapidly has been pointed out by Heidenhain, of Greifswald. The lingual muscles are contracting almost constantly, and as a result cancer-cells are forced along the lymph-spaces to healthy areas.

Treatment.—A cancer of the tongue should be removed radically at the earliest possible moment. Before any operation is undertaken all stumps of teeth should be extracted. During several days preceding an operation the teeth should be scrubbed twice a day with a brush and soap, and the mouth rinsed with hydrogen peroxid. The nares and nasopharynx should be sprayed with peroxid of hydrogen and then with boric-acid solution every second or third hour when the patient is awake.

In this disease not only the tongue, but also the adjacent lymphatic glands must be removed. The lymph-vessels from the tongue pass to the submaxillary and deep cervical lymphatic glands.

It was my belief until recently that in a very recent and limited case only the glands on the diseased side require removal, but that in an advanced case the glands must be removed from *both sides* of the neck. Experience has convinced me that in any case the glands on both sides should be removed. Kuttner, of Tübingen, has demonstrated that lymph from one side of the tongue may flow to glands on the same side of the neck; but some also may flow to the opposite side of the tongue. Two operations are to be considered: partial removal and complete removal.

Partial Removal of the Tongue.—This operation is restricted to recent cases in which one side only of the anterior portion of the tongue is involved. The operation does not offer as good a chance of cure as complete excision, because lymph containing cancer-cells may have reached the opposite side of the tongue. Even in partial removal the glands should be removed from both sides.

In performing the operation of partial excision introduce a mouth-gag, place a silk ligature on each half of the tip of the tongue, and draw the tongue out of the mouth (Barker). Place the patient in the Trendelenburg position. Split the tongue back in the middle line with the scissors, and loosen the cancerous side from the floor and side of the mouth. Pass a stout silk ligature through the base of the tongue posterior to the cancer. Draw the organ out and cut off the diseased side in front of the ligature but back of the disease. Tie the vessels, remove the constricting and traction threads, and treat subsequently as in cases of complete removal.

Complete Removal of the Tongue (Kocher's Method).—Kocher recommends a preliminary tracheotomy in tongue-excision, but the Trendelenburg position renders this procedure unnecessary so far as fear of the passage of blood into the larynx and trachea is concerned. The instruments required are a scalpel, retractors, a dry dissector, hemostatic and dissecting forceps, a tenaculum, aneurysm-needle, tenaculum forceps, needles, sutures, and scissors. In this operation the patient is placed in the Trendelenburg position, the surgeon standing to the side. Ether or chloroform is given. Ligate the lingual artery on the side opposite to the one where the main incision is to be made. Remove the glands on that side and suture the wound. An incision is then made on the side opposite to that on which the artery was ligated. This incision passes from behind the lobe of the ear, along the anterior edge of the sternocleidomastoid to about the middle of the margin of this muscle. From this point the incision is carried to the level of the hyoid bone and then to the symphysis menti, along the anterior belly of the digastric muscle (Fig. 360). The flap is dissected and turned up; the facial and lingual arteries are ligated; "the submaxillary fossa is evacuated" (Treves); the sublingual and sub-



Fig. 360.—Kocher's excision of tongue (Esmarch and Kowalzig).

maxillary glands are removed; the mylohyoid muscle is divided; the mucous membrane is incised close to the jaw, and the tongue, caught with tenaculum-forceps, is drawn through the opening. The tongue is split in the middle with scissors, and the near half is removed, bleeding is arrested, the remaining half of the tongue is cut through, and the vessels are tied. Stitch the mucous membrane of the stump to the mucous membrane of the floor of the mouth with catgut sutures. Kocher does not suture the skin-wound; many surgeons do suture it and employ drainage-tubes. I follow the suggestions of

Treves as to after-treatment. Some hours after the operation, when oozing has ceased, dust the mouth-wound with iodoform. The patient, as soon as possible, is propped up in bed, and he must not swallow the discharges if it can be avoided. The mouth, every half hour, is sprayed with peroxid of hydrogen and washed with a carbolic solution (1 : 60). Every three hours after washing the floor of the mouth and the stump the parts should be dried with absorbent cotton and dusted with iodoform. For twenty-four hours after the operation nothing is given by the mouth except a little cracked ice, the patient being fed per rectum. At the end of twenty-four or forty-eight hours some liquid food is given from a feeding-cup. The patient will soon learn to swallow; but if he cannot swallow easily, he is fed with a tube. Treves, in his clear and positive directions for after-treatment, states that nutrient enemata are to be continued until sufficient nourishment is taken by the mouth; that the mouth should be flushed by irrigation, and must be washed immediately after taking food; that morphin is to be avoided; and that the patient can usually leave the hospital in from seven to ten days.

Whitehead's Operation.—Whitehead removes the entire tongue from within the mouth by the use of scissors. He passes a ligature through the tip, cuts the

frenum, draws the tongue strongly forward, and separates by a series of clips with the scissors. The lingual arteries are tied as cut. "The stump should be kept under control, as regards hemorrhage, by a stout silk ligature passed through the remains of the glosso-epiglottidean fold and retained for twenty-four hours."*

Heath has shown that if the forefinger be passed to the epiglottis and used to "hook forward" the hyoid bone, the lingual arteries are stretched and portions of the tongue can be removed almost without bleeding. It is rarely desirable in Whitehead's operation to remove the glands and the tongue at one séance. To do so increases shock and the danger of death. The rule of procedure set forth by W. Watson Cheyne † is eminently wise. This rule is as follows: If glandular involvement is trivial or not detectable, it is perfectly proper to remove the tongue first, and after a week or so remove the glands. If the glandular involvement is marked, growth in the glands will be much more rapid than growth in the tongue. In such a case the glands should be removed before the tongue, because, if the tongue is removed before the triangles are cleared, in the week or two of waiting the case may become inoperable. In the majority of cases clear out the triangle before removing the tongue, doing the other operation in one or two weeks when the wound in the neck is healed. If the disease in the mouth is far advanced, do both operations at one séance.

Stricture of the Esophagus.—*Fibrous or cicatricial* stricture is due to the healing of an ulcer, and results from traumatism, chronic inflammation, syphilis, tuberculosis, chronic ulcer, prolonged vomiting, variola, gout, or to swallowing a corrosive substance or a boiling liquid. It is commonest in the young, and is apt to be situated opposite the cricoid cartilage, at the tracheal bifurcation or near the cardiac end. Cicatricial strictures are usually single, but may be multiple. Stricture following impaction of a foreign body is located at the seat of impaction unless the tube has been injured by efforts at extraction, in which case multiple strictures may exist (Maylard). Strictures which result from swallowing boiling fluid or corrosive liquid are usually very extensive, and may be multiple. Syphilitic stenosis is due to the healing of a gummatous ulceration, but there is nothing characteristic in this kind of stenosis. Tuberculous stenosis is extremely rare.

Symptoms of Cicatricial Stenosis.—The condition may occur at any age. The chief symptom is difficulty in swallowing, at first slight, but becoming more and more pronounced until swallowing is almost or quite impossible. The dysphagia is first manifested to dry solids, then to all solids, and finally to liquids. In some cases vomiting occurs after swallowing. If the stricture is high up, the vomiting is almost immediate; if it is low down, the vomiting is delayed, especially if the canal is dilated above the stricture. From time to time the patient vomits independently of taking food, the ejected matter being saliva. The vomited matter is not bloody. The patient feels weak and hungry, becomes exhausted and emaciated, and suffers from flatulence, gastralgia, and constipation.

There is occasionally slight uneasiness or even pain in the region of the stricture, possibly "about the epigastrium or between the shoulder-blades" (Maylard). The stricture may be located with a bougie and by auscultation over the spine on a line with the supposed obstruction. While a patient

* "American Text-book of Surgery."

† The Practitioner, April, 1899.

is swallowing water, the arrest of the fluid at the seat of stricture may be audible. Even if the fluid passes, it will be delayed for a time and the duration of deglutition is thus prolonged. In order to determine the time of deglutition put the ear just below the angle of the left scapula, put a finger on the patient's Adam's apple, and hold a watch in the other hand. Have the patient take a drink of water. Count the time from the moment the Adam's apple begins to rise until the fluid is heard to gurgle into the stomach (Ogston's method). It ordinarily requires four seconds for food to pass from the mouth into the stomach (Maylard). The history of the case is of much importance in diagnosis. The surgeon must inquire about impaction of a foreign body, or swallowing of acids, alkalies, or boiling fluids; and must examine for evidence of syphilis.

If there is no history of injury or syphilis, and the patient is over forty years of age, the indications point to cancer rather than cicatricial stenosis. The easy passage of a bougie when the patient is anesthetized shows that spasm is the cause, and not organic disease. Narrowing due to external pressure is marked by positive symptoms of the causative disease.*

Treatment.—Thiosinamin is given by some physicians, but I have never seen it accomplish the slightest good. Telleky † recommends it in old scars without inflammation. He makes a 15 per cent. alcoholic solution and injects from half a syringe-ful to a syringe-ful at a dose, throwing the fluid beneath the skin between the scapulae. He uses 20 doses in the course of two weeks. *Gradual dilatation* through the mouth is a method

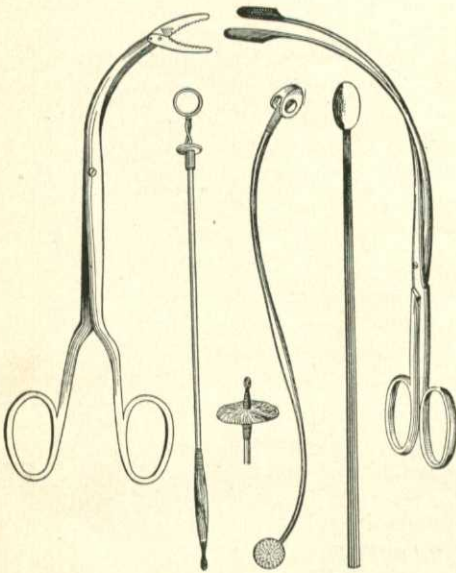


Fig. 361.—Esophageal instruments: A, B, Forceps; C, horsehair probang; D, coin-catcher; E, esophageal bougie.

employed for at least a time in almost every case. Begin with the largest bougie which will easily pass. Warm the bougie, oil it, pass it gently, and hold it in position for several minutes, prolonging the time of retention of the bougie as treatment progresses. Pass an instrument every second or third day, gradually increasing the size. If the stenosis involves a considerable portion of the esophagus, gradual dilatation will almost certainly fail to cure.

Symonds advocates the insertion of a tube through the stricture and leaving it in place until there is decided dilatation, and then replacing the tube with a larger instrument. The patient is fed through the tube. Gradual dilatation from below has been practised in cases where a bougie could

* See the excellent article in Maylard's "Surgery of the Alimentary Canal."

† Wien. klin. Woch., Feb. 20, 1902.

not be passed from the mouth. A gastrostomy is performed, and after the fistula has become sound the patient is made to swallow "a shot to which is attached a silk thread" (Maylard). The silk thread is brought out through the fistulous orifice and is attached to a bougie, and the dilating instrument is pulled up through the esophagus. *Forcible dilatation* can be employed through the mouth or through a gastrostomy opening, by means of bougies, tents, or divulsing instruments. *Electrolysis* is used by Fort and others. Some surgeons perform *internal esophagotomy* through the mouth with a special instrument. A fibrous stenosis in the region of the cricoid cartilage

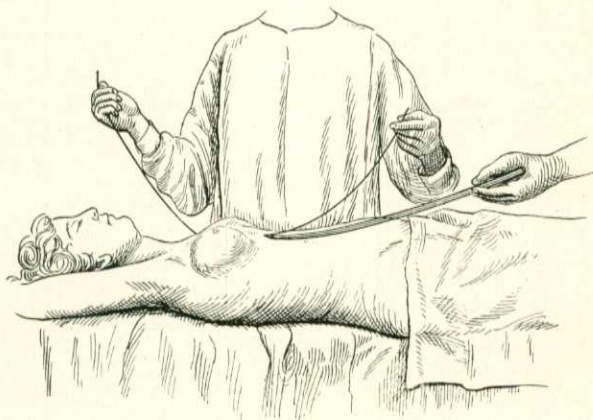


Fig. 362.—Abbe's method of cutting esophageal strictures.

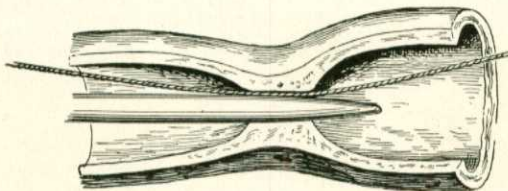


Fig. 363.—The bougie engaged in the stricture while the string-saw is being used.

which is not cured by gradual dilatation should be treated by the operation of *external esophagotomy*. In this operation the stricture is divided by a longitudinal incision; "funnel-shaped retraction of the cut portion is caused by adhesion to the external tissues divided, and it lessens future contraction."^{*} If dilatation fails in the case of a stenosis above the line of the aortic arch, the esophagus may be opened above the stricture (external esophagotomy), a tenotome is introduced through the wound, the stricture is cut and well dilated by the passage of instruments. This operation is known as Gussenbauer's combined esophagotomy.

^{*} W. J. Mayo, Jour. Amer. Med. Assoc., July 29, 1899.

If a stricture is impassable from above, the stomach should be opened and retrograde dilatation be carried out. A firm, non-dilatable stricture in the thoracic portion of the esophagus can be treated by Abbe's method (Figs. 362 and 363). He performs a gastrotomy, passes a conical rubber bougie from the stomach into the mouth, ties a piece of braided silk to the bougie, withdraws the instrument and leaves the silk in place. One end of the silk emerges from the mouth and the other end from the gastrotomy wound. In some cases he opens the stomach and also opens the esophagus above the stricture; one end of the string comes out of the esophagotomy wound and the other end out of the gastrotomy wound. The string is used as a string- or bow-saw, the stricture is divided, the silk is withdrawn, full-sized bougies are passed, and the wound or wounds are sutured.

An operation devised by A. J. Ochsner is thus described by Mayo*: "The anterior wall of the stomach is drawn out of a left oblique incision through the abdominal coverings; a small opening is made into the stomach sufficient in size to introduce the finger. A whalebone probe, to the tip of which a silk string guide has been tied, is now passed through the esophagus either from above or retrograde, as in the Abbe method. With this guide a loop of silk is drawn out of the gastric incision in such manner as to leave the guide as a third string. Into this loop a small soft-rubber drainage-tube three feet or more in length is caught in the middle by traction on the ends of the doubled thread through the mouth; this loop of rubber tube is drawn through the stomach and made to engage in the stricture.

"The greater the amount of traction, the smaller the stretched rubber tube, until it is sufficiently reduced in size to enter the stenosed portion; by alternating the direction of the pull the tube is drawn out by its free ends and in by the silk loop. Increasing sizes of tubes can be employed, and if necessary the third string can be used as a string-saw, after the Abbe plan of procedure." In a very severe case of stenosis gastrostomy is performed to keep the patient from starving. In a case of fibrous stenosis in charge of the author it was found impossible to insert any instrument from above or from below. Gastrostomy was performed by Kader's method. The patient was fed through the artificial opening and the esophagus was thus put at rest. Two weeks after the operation it became possible to pass a bougie from the mouth. The gullet was gradually dilated to its normal caliber and the gastrostomy wound was closed. This case demonstrates that a stricture of the esophagus, like a stricture of the urethra, may become temporarily impassable from inflammation, edema, and spasm; but, after the part is put at rest, will again permit the passage of an instrument.

Carcinoma of the Esophagus.—Cancer causes obstruction of the esophagus. It arises in those beyond middle life, and is far more common in men than in women. The disease may begin at any portion of the gullet, but is least often met with in the central portion (Maylard, Butlin). Epithelioma is the usual form, but scirrhus or encephaloid may occur. Cancer soon ulcerates, involves adjacent parts, and affects the deep cervical and posterior mediastinal glands.

Symptoms of Cancerous Stenosis.—The patient is over forty years of age, is usually a male, and presents the same difficulty of swallowing met with

* Jour. Amer. Med. Assoc., July 29, 1899.

in cicatricial stenosis. The vomited matter is apt to contain blood, the use of the bougie causes bleeding; there are generally decided pain and very great emaciation. The seat of obstruction is located by the bougie and by listening over the spine while the patient is attempting to swallow water. The stomach is the seat of pain; the mouth is dry and there is often great thirst. As the disease infiltrates the involvement of adjacent regions produces other symptoms. Dyspnea may result from tracheal pressure. Pleuritis, pericarditis, or pneumonia may arise.

Treatment.—The disease is of necessity fatal, and treatment is only palliative. Complete excision is scarcely feasible. The patient should be put upon a soft, bland diet, small quantities being given frequently. When trouble is experienced in swallowing the bland and soft food, pass a soft bougie every third or fourth day. When the patient becomes entirely unable to swallow soft food we may insert a Symonds tube or do an esophagostomy (if this can be performed below the stricture), or perform gastrostomy. In every doubtful case of esophageal stricture give a course of iodid of potassium before performing any operation.

Spasmodic Stricture of the Esophagus (Esophagismus, Hysterical Stricture).—By this term is meant a spasm of the circular muscular fibers of the gullet, which is most common at one end of the tube. This condition not unusually arises in a hysterical individual, in which case it will be associated with the stigmata of hysteria, especially globus hystericus. In some cases evidences of hysteria are wanting, although the patient is neurotic, and the condition is due to a reflex irritation. It may arise in cases of cancer of the stomach, cancer of the liver, ulceration of the larynx, and during pregnancy. I have seen two instances in cancer of the stomach. It occasionally occurs in tetanus, and sometimes in epilepsy.

Symptoms of Spasmodic Stenosis.—It arises suddenly in a hysterical or neurotic individual. It may last for a time and suddenly pass away, or may persist for a long time. The difficulty in swallowing is irregular; sometimes solids are taken more readily than fluids, and vice versa.

There may be regurgitation; but if it occurs, it does so at once on swallowing food. Examination with a bougie detects the obstruction. If the bougie is held firmly against it, in most cases the spasm will, after a time, relax and let the instrument pass. A medium-sized instrument or a large instrument may not pass until the patient has been anesthetized, but in every case a bougie can be passed after an anesthetic has been given.

Treatment.—The systematic passage of bougies. Occasionally the passage of an instrument but once will cure a case. The general health must be improved, and in persistent cases it may be necessary to use electricity within the esophagus, employ cold locally, and administer the bromids.

Diverticula of the Esophagus.—Maylard tells us that these pouches may be due to one of four causes—they may be congenital; may be due to stricture; may be caused by pressure from within, upon a weak spot of the wall; may be due to traction from without, by the healing and contraction of an area of inflammation.

Symptoms.—When the diverticulum is in the neck a lump forms during deglutition, and this lump may be obliterated by pressure. Food will pass into the stomach only when the diverticulum is full. A bougie cannot be

passed unless the pouch is full of food, at which time it may pass or may not. Sometimes it enters the pouch. This latter symptom, the variability in the passage of the bougie, is the evidence relied on for diagnosis in intrathoracic diverticula. By listening with a stethoscope fluid may be heard to pass into the pouch. After a patient swallows food mixed with subnitrate of bismuth a diverticulum may be skiagraphed. The opening may be seen by means of an esophagoscope.

Treatment.—Extirpation and suture, as performed by von Bergmann, Hearn, and others. For five days after operation no food is given by the mouth.

Injuries of the Esophagus from Within.—Injuries of the internal surface are more common than injuries from without. Burns and scalds are among these injuries. Wounds may be inflicted by foreign bodies. Injuries of the gullet cause pain on swallowing and a severe injury induces bleeding, the blood being both coughed up and vomited. A severe wound may involve a large vessel and cause violent or even fatal hemorrhage. If the bronchus or trachea is involved, there will be “cough and expectoration of blood, mucus, and food” (Maylard). The pleural or pericardiac sacs may be perforated.

Treatment.—Feed only by the rectum. Give morphin hypodermatically. Do not feed by the mouth for ten days, and even then give only fluid food and jelly. Symptoms are met as they arise. After burns by caustic, administer the antidote; give large drafts of water and wash out the stomach. From two to four weeks after a caustic has been swallowed and after a burn or scald, the use of sounds should be begun, and sounding should be persisted in for a considerable time to prevent contraction.

Injuries of the Esophagus from Without, Other Structures not being Seriously Involved.—Such injuries are rare. Esophageal injuries, as a rule, are associated with serious damage to adjacent structures. These injuries may be due to stabs or to bullets. Besides the obvious external signs of the injury there will be difficulty in swallowing, cough, bloody expectoration or vomiting; and mucus or the contents of the stomach may run out of the wound.

Treatment.—Suture the wound, and feed by the rectum for ten days.

Foreign Bodies Lodged in the Esophagus.—These accidents occur especially to children and lunatics, and women are more apt to suffer from them than are men. An extended list of bodies which have been swallowed will be found in Poulet’s elaborate treatise. There are three regions where a foreign body is especially apt to lodge—viz., opposite the cricoid cartilage, at the level of the diaphragm, and at the point where the left bronchus crosses the gullet. Small and sharp bodies may lodge anywhere.

Symptoms.—The symptoms are variable; if the body is large, there will be pain and difficulty in swallowing, and, in some cases, dyspnea from pressure upon the trachea or bronchus. Occasionally the dyspnea is such a prominent feature that it misleads the physician into the belief that the foreign body is lodged in the air-passages. Death may actually result from asphyxia. In some other cases the symptoms are very slight. If the body is sharp, there will be hemorrhage and severe pain. The blood may be hawked up, or may be swallowed and vomited. A patient may grow accustomed to a foreign body and cease to notice it; but, on the contrary, the foreign body may

produce inflammation, and even may ulcerate into the windpipe, the pleura, the pericardium, or the aorta. In many cases of impaction a patient makes violent efforts to hawk, and produces aphonia. There may be violent retching. Even after a foreign body has been removed by swallowing or otherwise a sensation is apt to remain as if it were still lodged. The diagnosis is made by the history, the detection of the body by external manipulation, by feeling it with an esophageal bougie, and, if bone or metal, seeing it with the fluoroscope or obtaining a skiagraph.

Treatment.—The surgeon should learn, if possible, the size, shape, weight, and nature of the foreign body, and should locate its point of impaction. The exact point of lodgment of bone or a metallic body is determined by the x-rays.* An anesthetic is given before manipulating in a child, a nervous woman, or a lunatic, and is *sometimes* necessary for a man. If the foreign body is soft, external manipulation may succeed in altering its shape, so that it may be swallowed or ejected. If the foreign body is hard, external manipulation may shift its position. It is usually impossible to reach the foreign body through the mouth by means of the fingers (when the body is in the rear of the pharynx it may be pulled forward or pushed down). Sharp foreign bodies may be entangled and carried down when the patient eats mush, bread, or boiled potatoes. The administration of emetics is an old plan which occasionally succeeds, but which is too unsafe to be employed. Maylard says that when a mass of food is impacted it is occasionally possible to soften and disintegrate the mass by administering a mixture containing pepsin. The horsehair probang is a very useful instrument (Fig. 361, c). It may be used to push a body downward into the stomach, or to catch the body and pull it up. When this instrument is withdrawn it opens like an umbrella. Maurice H. Richardson has shown that in an adult the diaphragmatic opening is about fourteen and one-half inches from the incisor teeth, a point to be remembered in deciding whether to push down or pull up the impacted article. Esophageal forceps (Fig. 361, A, B) are valuable in some cases. The coin-catcher (Fig. 361, D) is a useful instrument. Créquy's plan of removal is to take a tangled mass of threads, tie a stout piece of string about the middle of it, coat it with sugar, and have the patient swallow it. It may pass the foreign body; if it does so, on withdrawal it may entangle the object and extract it. To remove a fish-hook with line attached, the following plan may prove successful; stick the line which projects from the mouth into a metal catheter, carry the catheter down to the hook, and push the hook out. It is not proper to allow a foreign body to remain in the esophagus until it causes ulceration. Neither is it proper to make prolonged efforts to extract it through the mouth. Such efforts may do great harm, and if one careful and consistent effort fails an operation should be performed. If the body is lodged anywhere above the lower third of the esophagus, external esophagotomy is performed, and usually on the left side. Through this wound the foreign body is extracted. The cut is made on the left side, between the trachea and larynx in front and the carotid sheath behind, the center of the incision being opposite the cricoid cartilage. After the foreign body is extracted the mucous membrane is sutured with chromic catgut, and the superficial structures are closed with silkworm-gut after a drainage-

* See cases of White, Keen, Alfred Wood, MacIntyre, Taylor, and others.

tube has been inserted. The patient is fed by the rectum for eight or ten days. When a foreign body is lodged in the lower portion of the tube, the stomach is opened and the body extracted by this route (Richardson). In White's case of jackstone in the gullet gastrostomy was performed. A string was tied about some rolls of gauze, the string was passed by means of a whalebone from the stomach into the mouth, and the body was entangled and drawn out.

Surgical Invasion of the Mediastinum.—The posterior mediastinum has been entered in order to remove a foreign body from the bronchus and to extract a set of false teeth wedged in the esophagus. The same method can be followed to reach suppurative processes in the mediastinum, abscesses of the lung otherwise inaccessible, and diverticula of the lower end of the gullet (Enderlen, in "Deutsche Zeitschrift für Chirurgie," Nov., 1901). The anterior mediastinum may be entered to remove a bullet, to drain an abscess, to reach a wound of the heart or lung, and to explore for the cause of symptoms. I explored the anterior mediastinum after rib resection, found a bullet imbedded in the aorta, and allowed it to remain. The patient recovered. M. H. Milton* splits the sternum and separates the two pieces.

* Lancet, March 27, 1897.