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3. There are no buried, non-absorbable sutures left to irritate the tissues and cause further trouble.
4. There is no necrosis from tight sutures, therefore few, if any, stitch abscesses.
5. The gauze rolls act as elastic cushions which prevent scars from the sutures.
6. The operation completely closes the breech and makes a firm wall.
7. All sutures, after serving their purpose, are removed, leaving only the natural supports.

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EVOLUTION IN THE TREATMENT OF CANCER OF THE RECTUM.*

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Certain definite results are desired in operations on cancer of the rectum, namely, permanent cure, low operative mortality and a controllable anus, or its best substitute. These results are modified by location, stage of progress and the age and condition of the patient.

The gradual evolution which has led up to the treatment in vogue to-day makes an interesting study. Previous to 1870, operative treatment on cancer of the rectum was but limited in extent, and only performed by the great surgeons of that time; in fact, it was almost limited to nothing, palliation, and lumbar colostomy. Yet the results of these methods compared most favorably with radical operations.

At present a diminishing number of patients present themselves at such a late period that they fall within the limits of this type of surgery. Inguinal colostomy has replaced the lumbar. During the next ten years to 1880 there was a marked advance in all surgery. Instead of there being but a few surgeons with initiative, a large number were making active scientific progress. New and often similar methods of procedure were devised by surgeons widely separated and each without knowledge of the investigations of the others. This progressive spirit, which fortunately continues, resulted in many operations bearing the names of two and even three surgeons who had advanced the principles at about the same time.

In rectal surgery there were developed the circular enucleation of Lisfranc, perineal excision, Deffenbach's incision anterior and posterior to the anus, and the great advance made by Kocher in 1874, when he excised the coccyx to gain access to the rectum. Many surgeons still contend that by this method sufficient space is secured to accomplish the removal of all cases which should be attacked from below. Verneuil also deserves credit for removal of the coccyx at this time.

The difficulties which were most marked during this period were sepsis, which could not be avoided, stricture or incontinence from the loss of the anus, and recurrence, the most serious of all as well as the most frequent. The recurrence most commonly seen was probably from incomplete removal and at times undoubtedly from direct inoculation of the wound by the cancer. The direct inoculation of wounds by both cancer and sarcoma cells is a condition well understood to-day, and many operators to a certain extent avoid this complication by excising the anal and low-lying cancers of the rectum with a Paquelin cautery; others, when the cancer unavoidably contaminates the wound, apply carbolic acid, followed by alcohol, to prevent germination and absorption. Surgically considered, this was an epoch of drainage.

During the years from 1880 to 1890 was developed the germ theory which revolutionized surgery and medicine. This period was one of antisepsis and drainage. Operations in all lines of surgery became more radical. The perineal methods were made more complete. Rehn, a German, and Campenon, a Frenchman, at about the same time brought out the vaginal route for certain cases of rectal cancer, a method which has been so highly developed and popularized by Dr. J. B. Murphy. Steinthal removed invaginating cancers by means of an elastic ligature. In 1883 Volkman opened the sacral canal in an operation for sarcoma. Kraske, at that time his assistant, noticing that no harm resulted, was led to develop his sacral excision method of operation. Now all varieties of sacral exposure bear his name, although variously modified by Bardenheuer and others in being more extensive, by Heinecke, Roux and Rehn and others in preserving the bone by a temporary resection, and by Zuckerkandl in making a parasacral incision.

The difficulties which arose were from shock, which usually meant loss of blood; from peritonitis, as two-thirds of the Kraske operations necessitated opening the peritoneum; and from the attempt to perform radical operations on inoperable cases, as the damage to the bone, loss of blood and open peritoneum were necessary by this method, before the operator knew fully the extent of the disease. The anus had usually been sacrificed; now, where possible, attempts were made to preserve this outlet. Various methods of uniting the distal and proximal bowel were devised. Suture methods frequently failed, or partially failed, leaving permanent fistulæ, as did all methods much too often, were they plastics, Murphy's button or invagination. The Hochenegg method of invagination by passing the proximal end through the anus and suturing to the skin, was later modified by removal of the mucous membrane of the anus. One of the best methods was to draw the proximal bowel through the anus, which was inverted, and make a circular suture union, which is replaced within the sphincter. Lange made a half circular incision anterior to the anus, admitting of its being depressed two inches to reach the proximal end. With the anus saved, it was often found that the extensive mutilation had permanently injured its nerve supply, and when saved intact, that it required the levator ani and internal sphincter to render it functionally perfect in preventing the sudden escape of gas and thin feces.

Gerster states that practically all of these methods of union result in primary or secondary stricture, which is from the character of the surrounding tissue. Most frequently it was found that so much bowel had been removed that a sacral anus was necessary. When an artificial anus is determined on, Witzel, Wilms and Rydygier recommended the division of the glutinus maximus, made at one side of the sacral incision and the suture of the bowel end to a skin incision, thus gaining muscular compression. Gersuny rotated or twisted the bowel sufficiently to close its lumen and sutured. Still, in spite of all methods, only approximately 15 per cent. of these patients secure anything like a controllable anus. The incontinence which ensues is not comparable to those cases of torn or paralyzed sphincter or sacral fistula, as such cases still have the seventeen-inch loop of sigmoid in the pelvis—whose value as a fecal container

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was pointed out by Wyeth—with the natural constriction at the top of the rectum to control the fecal current. Yet such cases presenting themselves for relief are often considered as bettered by an inguinal colostomy. The local recurrence, which is so frequent, often causes such a degree of obstruction as to require a later colostomy, a condition which we met in three cases. The direct channel of the colon from the splenic flexure to the outlet leaves no space for a fecal container and renders closure a question of hydrostatics in these operations.

The last decade has seen an advance in methods derived from an analysis of the mortality and failures in the past, and the gain has resulted in the present thoroughness of surgery, and asepsis for antisepsis. The block removal of the rectum and glands where possible from below and in high location of the cancer, the combined abdominal and perineal method of removing rectum, glands and all malignant tissue *en masse,* is the new surgery for cancer of this region. This method is merely the application of principles of the general surgery of cancer, regardless of location, as exemplified by Halsted's operation for the removal of cancer of the breast. It is probable that the removal of cancer of the rectum in the past compares well with the removal of cancer of the breast before the radical operations were made on the lymphatic system, with the exception of the former being in a more septic region. The combined abdominal and perineal method is now advocated for high rectal carcinoma by the pioneers in rectal surgery, Kocher, Kraske, Gaudier, Quenu, Trendelenberg, Abbe, Weir and numerous others.

Cancer in the young is much more serious than in the old, both as to rapidity of growth and early involvement of the glands, although it is frequent that the glands are only involved late in the disease. The average life with cancer of the rectum is given as from one to two years; this may be true in the young, but in the old, if we approximate the commencement, it must often exceed double this length of time.

Allingham considers the removal of cancer, in patients under 45 years of age, as unfavorable; between 45 and 60 years, as more favorable, and over 60 years, still more hopeful. Statistics change from year to year with the ability of the operator, whose judgment increases from his mistakes and failures, and whose ability to select a justifiable operation for rectal cancer, according to the extent, location, fixation, glandular involvement, cachexia and age, or invasion of neighboring organs, such as vagina, uterus, prostate or bladder, becomes more and more reliable. Therefore, statistics mean more to the surgeon who makes them than to any one else. Kraske's mortality in the first ten cases was 40 per cent.; this he has now reduced to less than 10 per cent. The average mortality is still somewhere between 15 and 18 per cent. Hochenegg, in 121 sacral operations, had 5 per cent. mortality and 25 per cent. cures.

Kroenlein (Zurich) answers three questions: mortality of operation, recurrence, and functional disability; 881 cases show that the sovereign method is extirpation, 80 per cent. survive, 14 per cent. are lasting.

The functional result is best when possible to preserve the anus and sphincter. In the discussion Kraske expressed satisfaction in his 120 cases of sacral method, but thinks the combined abdominal sacral method more radical. Gaudier of Lille begins with a laparotomy, and by section of the bowel at the iliac fossa makes an inguinal anus. The peritoneum is cut from the sides of the rectum and below and the rectum forced down by blunt dissection as far as possible, the peritoneum closed and the operation completed from the perineum. Gaudier claims the method is of aid in: first, complete extirpation of the cancer; second, removal of lymphatics; third, the possibility of complete asepsis; fourth, no bony mutilation; fifth, the artificial anus is more supportable and more easily supervised than in the sacral region.

Quenu separates the cancer by sacral operation first, then, if necessary, makes an abdominal incision and inguinal colostomy. Chalat of Toulouse practically performs Gaudier's operations.

In our own work we were compelled some two years ago, by the necessities of two cases, to operate from the abdomen in one and from the abdomen and perineum in the other. During the past year we have operated on four cases in which the combined operation was planned previously. The operation, as described by Gaudier, we modified in regard to the colostomy. Through a median opening the sigmoid is double clamped and cut at a point as low as possible, yet well above the cancer, then invert the mucous membrane and close both ends with a purse-string suture. This renders the remainder of the operation aseptic. The superior hemorrhoidal artery is ligated and the proximal sigmoid segment is loosened and brought through a McBurney gridiron incision in the iliac fossa. This incision is peculiar in the skin incision, being at a distance of one and one-half inches to one side of the muscle separation. The end of the bowel is brought out and sutured to the skin incision; also a few sutures unite the bowel to the peritoneum at the point of exit. This preserves the loop of sigmoid as a fecal container. Prolapse is prevented by sutures from within, the muscle separation and sigmoid curve of outlet with skin covering for compression give a fairly controllable anus at a position where the patient is enabled to give it proper attention. If the median incision discloses an inoperable condition, that is, inoperable from a curative standpoint, from metastasis in glands or neighboring organ involvement, an inguinal colostomy is made and the median wound closed.

Colostomy, as usually performed, has been by the lifting of a loop of sigmoid through an abdominal iliac incision. The loop is supported by one of the various methods and the bowel is sutured to the peritoneum and skin, forming a true funnel-shaped hernial opening in the abdominal wall; that is, skin and peritoneum in contact. There was often prolapse following late after operation, to avoid which the loop of sigmoid was caught up at such a point as to render the descending colon under slight tension in the wound, thus rendering the closure of the outlet a question of pressure against a descending flow. The best operation is that of Mixtere, in which the sigmoid loop is drawn through a McBurney gridiron incision, and a rectangular skin flap pedicle attached at one end is drawn through an opening in the sigmoid mesentery. The skin flap is sutured back to place at the free end and sutures applied to the bowel, peritoneum and skin. When the loop of bowel is cut through, this skin covering of the bowel acts as a valve when compressed by a pad.

To sum up the main objections of the past, we have:

1. Ineffectual removal with local recurrence so common in the perineal type.

2. The extensive mutilating character of the Kraske before operative conditions were known.

3. The frequent failure of all methods of union of proximal and distal portions of the bowel, which, when united and anus saved, with the destruction of the levator ani and internal sphincter, represented but one-third of the controlling apparatus of the bowel.

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4. The frequent formation of stricture either cicatricial or cancerous following operation necessitating inguinal colostomy.

5. The straightening and tension of the sigmoid destroyed it as a fecal container.

6. That sentiment and not chance has proven the main reason for continuing to place an uncontrollable anus in a comparatively inaccessible situation.

The gain in the combined operation has been in a selection of the operation to the case, either radical removal *en masse*, with all glands, fat and connective tissue or a colostomy for palliation. The retention of the sigmoid as a fecal container and the peculiar formation of the anus, giving a fair degree of control in an accessible situation.

SOME REMARKS ON SCLEREMA NEONATORUM,

WITH REPORT OF A CASE WITH AUTOPSY.

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Sclerema neonatorum is a rare disease. Up to the present time I have been able to find but seven cases reported in America, and a careful review of the literature of Europe affords but comparatively few examples of the strange condition. The obscurity of the etiology of the malady and the scarcity of clinical reports of cases with autopsies, as well as the meager and unsatisfactory descriptions of the same found in most text-books, render doubly interesting the report of a typical case, and afford an excuse for a perhaps too lengthy description of the clinical picture of the disease.

Uzembezius, a physician of Ulm, in a work entitled an "Ephemeris of Natural Curiosities," published nearly two centuries ago, described an infant, born at term, which from top to toe became rigid and cold, resembling a piece of flesh dried by fire. This is regarded as the first recorded case of infantile sclerema, and it was at that time ascribed to maternal impressions, since the mother of the baby had spent much time in the churches, worshipping the images and statues found there.

To Underwood, however, an English physician, belongs the credit of having first recognized and described the disease, a description, too, so vivid and so true as to have left little to be added or to be taken away. His observations were particularly noted in France, and the condition most thoroughly studied there, although for many years it was confounded with a very similar condition, edema neonatorum. This disease presents many features in common with sclerema, but differs in so many respects as to leave little doubt that they are essentially separate and distinct. Andry (1781), Leger (1825), Billard (1839), Villaix (1849), all recognized, studied and described the malady and developed many and ingenious theories to account for it. It remained for Parrot, however, the brilliant Parisian pediatrist, to establish the fact that sclerema neonatorum was a distinct clinical entity, although the conclusions of this observer have been somewhat modified by the studies of more recent years.

The subjects of this disease are usually found among the premature, weakened, poorly-developed infants of the foundling asylums. Cases occurring in private practice are exceptionally rare, although Parrot cites cases developing in well-nourished, robust and well-fed infants. Whether or not hereditary syphilis plays a rôle in the etiology is still a disputed point. Cases have been reported in which improvement or even recovery has followed treatment by mercurial inunction, but there is room for much skepticism as to the correct diagnosis in such instances. Within the past decade attempts have been made to isolate specific bacteria and to demonstrate that they were responsible for the development of the disease, but the number of observations in this direction is as yet too few for any definite conclusions to be deduced.

The affection, which is characterized by an induration of the skin and subcutaneous tissues, does not, as a rule, develop immediately after birth, but the symptoms are first noticed within the following seven to ten days, although according to Hennig they may be delayed as late as the seventh month. It is doubtful, however, whether such late developing cases should be regarded as instances of genuine sclerema neonatorum, but that they should rather be classed with scleroderma. In the first place, they do not correspond clinically with sclerema, they more frequently end in recovery and show a tendency for the induration to occur in isolated areas. It seems reasonable, therefore, to consider those cases which develop late as scleroderma infantorum corresponding to scleroderma adultorum, than to regard them as instances of true sclerema neonatorum as described by Underwood.

The symptoms may develop suddenly with no particular warning, may follow or complicate an acute disease, such as pneumonia, or they may be preceded by a variety of indefinite signs of general disturbance, such as vomiting, diarrhea with greenish stools, obstipation, convulsions, etc. The infant may become thin and emaciated, the eyes sinking into the orbits, the skin of the face taking on a sallow tint, becoming wrinkled, wizened, like the face of a little old man; or the disease may appear so suddenly that when first seen the characteristic induration may be the first and foremost symptom to which our attention is directed.

With such an onset the changes in the skin, which represent the essential feature of the disease, develop. In the invaded region the skin becomes swollen, shiny, losing its normal folds, appearing as if under tension, very like edema, but harder, firmer, showing little or no evidence of pitting on pressure. The elasticity and suppleness of the skin are gone; it is no longer possible to pinch it up into folds by the fingers; it is cold, clammy, greasy to the feel, for all the world like the outside rind of a ham. It is hard, as if glued down to the subcutaneous tissues; it is impossible to slide skin over subcutaneous parts, skin, muscle and underlying bone appearing to be fused completely together.

The color of the invaded areas varies from a dirty yellowish jaundice-like color to a livid blue black, the tints being comparable to the array of colors afforded by an area of ecchymosis slowly absorbed. The temperature of the part is always much reduced.

The amount of surface of skin involved varies within wide limits in different cases. It may remain circumscribed, death occurring to effectually check the progress of the disease. Again the skin of the lower extremities and trunk may be alone affected, or the whole surface of the body may take part in the process. The part which first shows the thickening may also vary. Most often the skin of the buttocks or thighs appears to be earliest diseased, from there spreading upwards and downwards on the trunk and on the lower extremities. It may then become general over the whole surface of the body. On the other hand, the skin of the face may be the first point

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