

CHAPTER XXI.

COMPLICATIONS OF HERNIA.

ALL patients with hernia have certain symptoms in common. Besides these there are certain complications that may arise in particular cases. The most important is strangulation; next to this is fecal impaction in the portion of the intestine included in the hernia; and, finally, inflammation of the hernia. These conditions cannot always be sharply differentiated, although they will be described here separately for therapeutic reasons. Any strangulation is associated with obstruction to the passage of feces and later with inflammation. There are, however, cases of fecal impaction and inflammation that need not be associated with strangulation.

IMPACTION OF FECES WITHIN THE LOOP OF INTESTINE INCLUDED IN THE HERNIA.

The loop of intestine within the hernia becomes gradually distended with formed fecal matter and may eventually become completely obstructed. The author has already mentioned that there is considerable difficulty for the passage of feces in the loop of intestine included in a rupture, especially when the hernia has existed for a considerable time in old individuals and is very large and irreducible. The chief cause is paralysis of peristalsis. The muscular coat, which is overtaxed and hypertrophied, degenerates and refuses to perform its usual duties when large quantities of indigestible food are consumed, or when there is some disturbance of digestion.

Symptoms.—These patients are usually accustomed to a certain amount of disturbance, and are apt to overlook the early stages. When the tension in the hernia becomes great, they are likely to become anxious, although the general condition is not much disturbed except for loss of appetite and a certain amount of palpitation. As a rule there is no fever. The hernia is not reddened and is not necessarily tender to touch. It is especially noticeable that there is no increased sensitiveness in the hernial ring. The abdomen becomes gradually distended: there are colic, nausea, and vomiting. The vomiting depends largely upon the taking of food and is only occasional. It is not the same as the vomiting of acute obstruction. The onset is gradual and the course chronic. The patients do not take much food, feel extremely uncomfortable, and emaciate. They become progressively weaker and die in the course of a few weeks without

there having been any especially acute disturbance. If the vomiting persists for some time, it may be more or less fecal in character. The autopsy does not show disturbances in circulation or inflammatory changes in these cases, although the intestine is stuffed full. Rose has repeatedly called attention to this condition.

Diagnosis.—The diagnosis is based chiefly upon the history. The hernial contents may sometimes be felt as formed, more or less resistant masses of feces. There is also absence of acute symptoms of strangulation.

Treatment.—The treatment is that of fecal obstruction in general. The chances of improving the condition are better if it is possible to push the distended portion of the intestine back into the abdomen, because the conditions for removing the contents of the bowel are then much more favorable. An attempt of this sort should be made under a general anæsthetic. Massage tends to immobilize the fecal masses and crush the impacted contents of the gut. If these measures do not give the desired results, continuous pressure may be applied with sand-bags or injections may be given of several quarts of lukewarm or cold water. Oil injections seem to be most effective, but do not act for a considerable time after being given. Should these efforts remain fruitless, irritating substances may be injected into the large intestine, such as concentrated salt solution or pure glycerin, which may stimulate the muscular contractions of the intestine. Cathartics are usually useless, and the more irritating drugs should be especially avoided. Castor oil may be given if it is deemed wise to give any cathartic. If there is the slightest suspicion of strangulation, one should avoid cathartics absolutely and administer opium even in large doses. After several days there may be a very surprising movement of the bowels as the result of this treatment. Washing out the stomach should be tried, especially when there is vomiting. Sometimes it is possible to remove a considerable quantity of intestinal stomach contents through the stomach-tube, and this diminution in the intra-abdominal pressure has a distinctly beneficial influence. It is astonishing how long the condition of these patients remains fair, even when they take very slight quantities of food. One should, therefore, never despair of relieving the condition. The prognosis of operations performed for this condition is bad, although in certain cases where there are symptoms of strangulation nothing else remains to be done. Fecal impaction of this sort is usually observed in old people, although it does occur in large hernias of children. Goyrand reports the case of a child six months old in whom the sigmoid flexure contained in the hernial sac was filled with fecal masses that could be pushed along after enlarging the hernial ring. This child died in spite of the large movements. Certain authors advocate morphine instead of opium, and of late years atropine has been recommended. The diagnosis of many of these cases is not certain, and in all probability the results are no better than when opium is used. Symptoms of poisoning may occur after using atropine.

INFLAMMATION OF HERNIA.

There are sometimes found in hernias secondary conditions indicating some previous inflammation without the patient ever having had any severe symptoms, with anatomical conditions that make it highly improbable that the hernia has ever been strangulated. These conditions are also found at autopsy and at operation. The hernial sac and contents are usually covered with peritoneum, so that any inflammation in this region will show the characteristics of localized peritonitis.

Slight cases may be secondary to some mechanical irritation, such as pressure from a truss, or some slight contusion, or forcible attempts at reduction in a hernia that is reducible although only with difficulty. Other cases are secondary to inflammation of the hernial contents, especially of the loop of intestine. Enteritis may be associated with ulcers, for instance, in typhoid and tuberculosis; and the inflammation following ulcerative appendicitis is also of importance in this connection. The appendix is found in the hernia alone or with other abdominal viscera, such as the cæcum, small intestine, and the omentum. This structure is liable to become infected, perforate, and produce a peritonitis which is walled off by adhesion from the general peritoneal cavity. Sometimes, however, the inflammation may extend to the general peritoneal cavity just as in the ordinary cases of appendicitis. The condition has frequently been confounded with a simple abscess, and the true nature was not recognized until a fecal fistula developed. If marked inflammation develops in a small rupture with considerable distention of the sac, high temperature and signs of strangulation without cessation of the movements or passage of gas, one might suspect appendicitis in a hernial sac. In an ordinary strangulated hernia the symptoms of inflammation appear later, while characteristic symptoms of obstruction have existed for some time. Several cases of tuberculosis of the hernial sac have been reported in Bruns', Socin's, and Helferich's clinics. The inner surface of the sac is covered with numerous tubercles (Fig. 232), and there is considerable cloudy fluid. Usually the condition was simply part of a general peritoneal tuberculosis. Sometimes the inflammation has extended to the sac from puerperal inflammation of the connective tissue in the pelvis, or from some suppuration in the vicinity of the hernia. These inflammations may produce a serous effusion, or a fibrous deposit, or pus. The micro-organisms may enter from the pelvic inflammation or from ulcers in the intestines. There are, however, cases in which it is more difficult to explain the method of infection; for instance, when suppuration takes place in a sac that contains only strangulated omentum, or when suppuration occurs in a sac that no longer communicates with the peritoneal cavity. It is to be presumed that at some prior date there was intestine as well as omentum in the sac, and that the pus-producing organisms escaped from the bowel, which had been reduced or slipped back itself while the inflammatory process in the sac continued to develop. In other

cases the inflammation seems to be metastatic; pus organisms deposited from the blood-current find conditions favorable for their further development.

Symptoms.—The symptoms may be slight; and patients with large irreducible hernias are too much accustomed to slight upsets to pay much attention to the signs. The more severe types, especially the suppurative variety, always present a pronounced clinical picture. The hernia becomes larger, tense, and painful. The overlying tissues become oedematous and hot. There are general symptoms, such as vomiting, colic, and sometimes collapse. It is important to remember that the pain in these cases spreads over the entire hernia, and is not localized to the neck of the hernia, as in cases of strangulation. It is also of importance that there is no complete stoppage of the bowels. There may be diarrhoea or very small movements with considerable gas. In inflammations with adhesions, observed especially when the omentum is down, palpation elicits a distinct sense of crepitation which is due to the tearing of slight adhesions. Sometimes the symptoms develop in such a way that they resemble those of an acute abscess tending to rupture externally.

Treatment.—In the slight cases without general symptoms rest in bed, ice, and attention to the bowels will be sufficient. When there are severe symptoms indicating suppuration one should not wait long before opening the sac, especially as in many cases it is uncertain whether or not the local condition is due to strangulation; and if there is the slightest doubt in this direction, an operation is always indicated, for reduction by taxis is absolutely counterindicated.

STRANGULATED HERNIA.

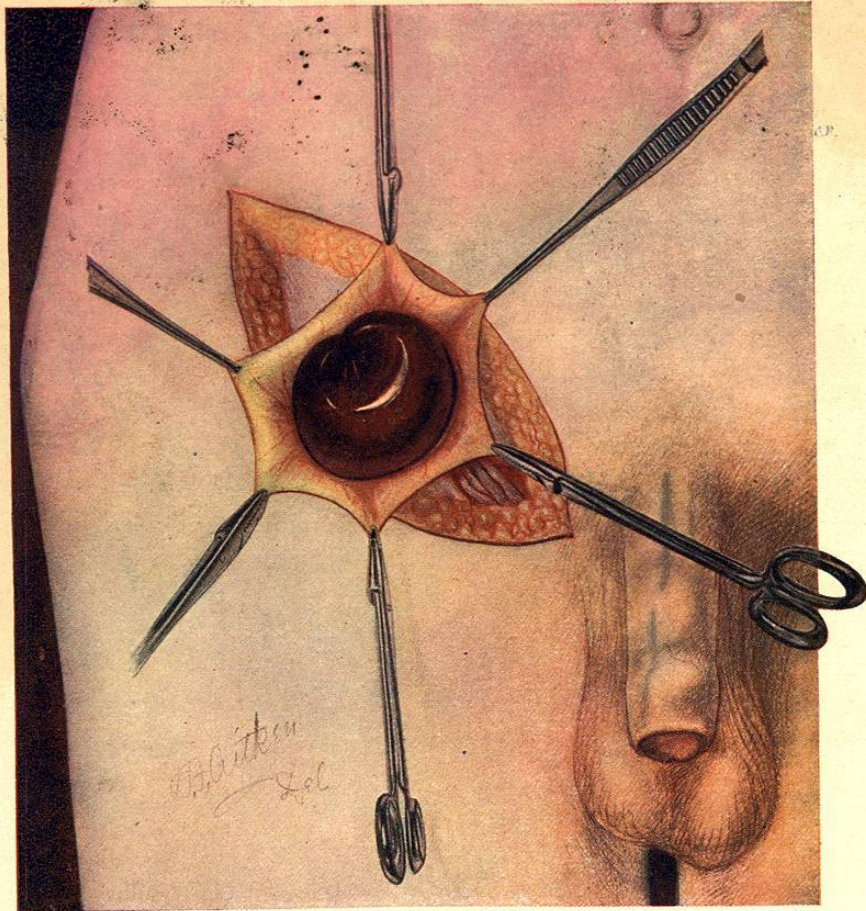
A strangulation is due to a constriction about the hernial contents that renders the rupture irreducible, interferes with the circulation of the hernial contents, and when lasting for any length of time is followed by gangrene. An elastic constriction or strangulation and fecal impaction or incarceration are distinguished.

A loop of intestine in the vicinity of the opening to the hernia becomes crowded down into the sac. When the increased amount of pressure diminishes, the hernial ring, which has been forcibly distended, contracts again and grasps the loop of intestine. The same mechanism applies when a large piece of intestine is crowded into a hernia that already contained considerable gut. The jammed-in piece of intestine cannot liberate itself, and when held down by a very firm ring taxis is of no avail. The only help to be had is by splitting up the ring. This elastic constriction of the intestine not only fastens the loop in place, but also produces stoppage of the bowels and interferes with the circulation. In slight cases there is venous congestion; but when the constriction is firmer there may be complete cessation of circulation, because the arterial supply is also cut off. The intestine

in these cases may be absolutely empty, for the contents may have been stripped back while the loop was being crowded down.

Fecal impaction is aided by the fluid or gaseous contents of the intestine. A considerable quantity of fluid or gas is suddenly crowded down into the loop of intestine contained in the hernia. When the pressure diminishes, the otherwise movable loop is fixed and the contents cannot be displaced. The hernial ring may be so large that one cannot speak of elastic constriction proper. At the neck of the sac there are some diminution in the lumen of the intestine and a certain lack of proportion between the ring and the hernial contents. Later this malproportion is followed by constriction. The constricting bands may be in the sac itself or the immediately surrounding tissues, but usually there is one special constricting band, although there may be several points in one and the same hernia. If the intestine is constricted in one place, so that the lumen of the gut is about 1 cm. (0.4 inch) across, liquid contents may be squeezed out under slight pressure. If, however, considerable pressure is used, the lumen becomes closed and not a drop can pass. This same effect is produced, as shown by Kocher, by gradual distention of the intestine above the point of constriction, so that the chief point is not the fact that the intestinal loop is filled with material, but that the intestine above is distended; and when this portion is filled with air the distended part exerts a certain amount of traction on that not distended. This in hernia is followed by a sliding downward of the mucous membrane of the portion of gut that is not held fast in the loop contained in the hernia, while the serosa remains fixed. Kinking of the intestine is also of considerable importance, and is more marked the greater the amount of traction exerted upon the intestine above by the portion held in the hernial sac. The mesentery also comes down with the intestine and crowds itself in between the two portions of the gut, so that the intestine is flattened against the side of the ring. In certain cases the constriction is due to rotation of the loop at a moment when it is considerably distended. (Scarpa, Roubaix.) When the constriction is elastic, it may be so firm that all the circulation is cut off immediately, resulting in complete anæmia, although in some cases only the veins are interfered with. Even when there is disturbance of the circulation at first, it is liable to develop secondarily to distention of the intestine with fluid or gas, as shown by Kocher. The congestion is associated with secretion of mucus, hemorrhages into the intestinal wall, and paralysis of the gut. It happens in this way that in cases in which the hernial opening is sufficiently large to allow the intestine to pass without constriction that the congested and thickened loop of bowel no longer has sufficient room in the ring and becomes secondarily constricted. The result of strangulation is finally gangrene. The severity of the disturbance, the rapidity of development, and the secondary symptoms vary, so that no uniform picture prevails. It is astonishing in how short a time the intestine may become gangrenous. The intestinal vessels have few anastomoses, and besides this the fecal

PLATE XV.



Strangulated Right Inguinal Hernia. The Sac has been opened and its edges are drawn apart by means of forceps. The Inguinal Canal and Spermatic Cord have been dissected. (Park.)

contents of the loop are very apt to decompose rapidly. The intestinal wall with its disturbed circulation is no longer able to resist the bacteria contained in the loop and gangrene rapidly supervenes.

The fluid accumulating in the hernial sac is called the hernial fluid, and is generally proportional to the duration of the strangulation and the size of the secreting area. In large inguinal hernias there is usually more, although there is a little disturbance of circulation where the secretion is most marked. When the circulation is completely interfered with, there is, of course, no fluid at all. This fluid is at first clear, amber yellow, serous, but soon becomes reddish, due to blood-pigment and blood, and may contain fibrin deposits or small coagula. The fluid may still remain clear under these conditions. It gradually becomes cloudy, due to the increasing number of white blood-corpuscles, and when persisting for a considerable length of time has a foul odor. If the intestine has become gangrenous, the entire sac may be filled with decomposing feces and gas. If the strangulation has lasted for more than twenty-four hours, bacteria are almost always found in the fluid. It would seem, however, as if the fluid had a certain bactericidal action, because the micro-organisms are not very numerous and seem to have diminished vitality. Cocci are usually found first, and later bacilli. There must have been some damage to the epithelium of the intestine which allows the bacteria to advance through the different layers, which is very apt to be the case if there are many small hemorrhages.

If the circulatory disturbance is relieved early, the intestine may recover. On the other hand, if it has existed for a considerable length of time, a loop of intestine that seems perfectly normal on inspection may later become gangrenous even after the constriction is removed. The gangrene usually commences in the mucous membrane. The layers of the intestine are first infiltrated with blood, in which the micro-organisms develop rapidly. Multiple purulent foci appear and extend toward the serosa. This finally loses its glistening appearance, becomes covered with fibrin, is more or less discolored, and the intestine becomes lax and friable, so that even the slightest amount of traction may produce a tear.

It is extremely uncommon to have extensive gangrene from the first. There are usually small areas that finally become confluent. The disturbances of nutrition appear first in places where the circulation is poorest—*i. e.*, along the convex border just opposite the attachment of the mesentery. The portion subjected to the constricting ring is frequently damaged most, and shows a marked indentation as if a string had been tied around. The gangrene in this place resembles that due to pressure, for it extends from without inward. Even before gangrene is at all evident macroscopically, micro-organisms may have infiltrated the layers of intestine, reached the serosa, and found their way into the peritoneal cavity, where they produce secondary peritonitis. There may also be considerable disturbance in the portion of the intestine leading to the strangulated loop. Above the hernia

there will be occlusion of the bowel and the contents are increased by active secretion from the mucous gland. This stagnant material rapidly undergoes putrefactive changes and the intestine becomes quickly distended with gas. This distention interferes with the circulation and the distended portion of the gut rapidly succumbs to a progressing ulcerative process which Kocher has called "stretching" ulcers. These ulcers may perforate and produce fatal peritonitis even when the strangulated intestine itself has been successfully relieved.

Here will be described an average case of strangulation. As a rule the patients mention some incidental cause, such as overexertion or some awkward motion or straining during stool. Sometimes they have partaken of a too hearty meal, or there is some digestive disturbance. The moment that strangulation takes place there will be an increase in the size of the hernia and marked pain that as a rule extends over the entire abdomen, but which becomes localized within a short time in the region of the hernia. Within a comparatively short time the individual has a movement of the bowels associated with more or less tenesmus. He may pass a certain amount of solid or liquid fecal matter, but does not get the desired relief. There is a distinct sense of obstruction felt as if at a certain point the intestinal contents and the gases could not be pushed out. The patient endeavors again and again to relieve himself by going to the closet; without success, however, even with the aid of injections or cathartics. At the very outset of the pain there is liable to be nausea and vomiting, which may at first be more or less connected with taking food or liquids, although the gagging and vomiting may not cease even when the stomach is perfectly empty. The hernial swelling becomes larger and harder and sensitive to pressure. The intestinal contraction becomes more marked and is associated with colic and borborygmus. The vomiting, which at first consisted of stomach contents, becomes more abundant and is mixed with bile. After the vomitus has had a distinctly offensive odor for some time a considerable amount of dirty greenish-brown material, resembling a decomposed loose movement of the bowels, is suddenly voided by mouth, frequently without any vomiting effort or gagging, just as if the stomach and intestines had overflowed.

In certain cases the general condition may be comparatively good, although the vast majority of the patients are very sick, restless, and anxious, and refuse all food because of the fear of vomiting. The pulse becomes small and increases in rate, the respiration becomes superficial, the extremities become cool, the tip of the nose looks pointed, the mucous membranes and ears are cyanotic. The patient is covered with cold perspiration and the temperature is subnormal. Many patients collapse in this stage with noticeable subjective euphoria without there having been any other complications.

In other cases peritonitis develops. The abdomen becomes distended, the skin is dry and hot, the face is reddened, and the temperature may rise, although not necessarily. Symptoms of peritonitis may

appear suddenly after perforation, or develop gradually, and the onset may be associated with quite noticeable subjective improvement. This does not last long, however, for the patients soon become weak, the pulse thready, and the facies pale and pinched, with a fatal result within a short time. In the meantime the hernia has undergone certain secondary changes. It is harder, the overlying skin is reddened and œdematous and is tender to touch. The œdema extends to the surrounding regions, and sooner or later one region bulges and shows distinct fluctuation. The skin becomes discolored here and ruptures. Decomposing pus and foul fecal matter are frequently passed in large quantities through the opening. This rupture may take place without involvement of the general peritoneal cavity, because adhesions may have formed between the intestine and the wall of the sac before the loop of gut became gangrenous. The peritoneal cavity is completely walled off in this way. When rupture does occur, it takes place first into the sac, an event that is followed by violent suppuration and inflammation that extends to the overlying tissues, which rapidly disintegrate. There are cases in which rupture of this sort takes place in a very short time and along the shortest route, so that the patients are suddenly relieved of all the annoying symptoms. This is, however, exceptional. Fecal abscesses of this sort usually undermine the different layers of tissue, form pockets, and involve the tissues diffusely before they reach the surface. In these cases it may take considerable time before all the individual pockets empty themselves, and the skin may be destroyed as far down as the middle of the thigh and over the lower half of the abdomen. Even when the peritoneum is not involved, therefore, these fecal abscesses are a source of much danger to the patient, and 95 per cent. of the strangulated intestinal cases left to themselves die. The causes of death are: (a) immediate shock, due to the effect of strangulation upon the nervous system; (b) collapse later, associated with symptoms of intoxication; (c) peritonitis with or without rupture of the gangrenous intestine; (d) severe fecal suppuration; (e) complications, such as pneumonia, etc., and some die of inanition even after an artificial anus is formed.

Symptoms.—An accurate history is very important, but the patients are very likely to make false statements or give a very indifferent description. Many patients do not know what a rupture is, or whether they have had one for a long time. They cannot state whether the hernia ever went back, or whether it is larger or smaller than it was formerly. Dread of an operation leads the individual to belittle his symptoms, or to claim that he feels considerably better during the last few hours. It is very important to find out what the first symptoms were: whether there was a change in the size of the hernia, and whether there was immediate pain, nausea, or vomiting. A strangulated hernia is irreducible. It becomes larger and harder, and after a certain time is sensitive to pressure. The increase in size and tension is the result of an increase in the contents of the sac.

The tension of the sac is increased by the additional intestine, the increased amount of fecal contents, and by the fluid accumulating in the intestine and outside in the sac. If the hernia was irreducible beforehand, the fact that when it becomes strangulated coughing and straining do not influence the tension is an important diagnostic point. If the intestine becomes gangrenous, the clinical picture will be that of fecal suppuration.

When the obstruction is complete, no fecal matter or gas will be passed. In the early stages the lower intestine may be emptied, although without relief to the patient. In rare cases when a loop of small intestine from the upper part of the gut has become strangulated, there may be a profuse loose movement due to the increased transudation into the lumen of the gut and increased peristalsis (cholera herniaria, Malgaigne). When only a section of the wall of the gut has become strangulated, there may be sufficient lumen left to allow the passage of fecal matter and gas.

Meteorismus above the strangulated loop is a further result of obstruction. The condition is not necessarily the result of occlusion, and develops only when the absorption of gas from the intestine takes place less rapidly than it is formed. There are cases in which the gut above is not distended, although the lumen below is completely occluded. It is, however, always present when the circulation of the intestine is interfered with, and is found almost constantly in the strangulated loop itself. The intestine here may be under such pressure that the condition is not noticed, but on opening the hernia it will become evident under how great tension the intestine has been, for the strangulated loop may suddenly distend enormously. This type of distention has been called by Wahl and Kader "local meteorismus." Besides this local variety, there is a type due to congestion with secondary paralysis of the muscles of the intestine, followed by accumulation of gas, because of the rapid decomposition of the fecal contents and intestinal secretion.

Vomiting is a further result of obstruction, and will become fecal sooner the higher up the strangulated loop of the intestine. When the strangulated loop belongs to a portion of the gut lower down, this symptom may be absent. The vomitus consists of decomposed fecal contents, which is voided in large quantities long after the patients have ceased to take food. It is in all probability largely composed of increased secretion of the irritated intestinal mucous membrane. Besides this fecal vomiting there is another variety which is due purely to some nervous influence. The poisonous products of decomposition become absorbed and are a distinct additional danger. The more sudden the strangulation develops and the more pronounced the symptoms due to bruising the intestine—*i. e.*, symptoms that appear when the intestine is injured in a similar way, such as a blow upon the abdomen or with peritonitis or torsion of the testicle or ovary. These symptoms, due to the effect upon the nervous system, are grouped together in the term "strangulation shock." By this is

meant considerable disturbance of the general condition, nausea, continued vomiting, small pulse, pallor of the skin and mucous membranes, and cold perspiration. Vomiting in these cases bears no relation to the kind or quantity of the intestinal contents. The effort to vomit is a reflex matter, and it is characteristic that this variety commences immediately after strangulation has taken place; therefore at a time long before the intestinal contents can have become stagnated. The physiological explanation of strangulation shock is given in Goltz's well-known experiment. This variety of disturbance is especially characteristic of the severer types of elastic constriction that interfere most with the nutrition of the intestine. The pain, which is also due to irritation of the nerves, is sometimes very violent, although certain patients are perfectly indolent, and it is by no means justifiable to conclude that the strangulation is of moderate degree just because this symptom is absent. There are certain complications that need not necessarily take place, but which may become of great importance. Peritonitis may be due to perforation or may develop gradually because of bacterial infection. Perforation is characterized by sudden violent pain spreading over the entire abdomen, which becomes uniformly distended so that the liver and splenic dulness is completely covered up. The pulse is small and rapid, respiration is increased, the extremities are cool, and the facies is the so-called facies Hippocratica. When peritonitis develops slowly, there will always be a slight rise of temperature. The abdomen becomes tense, due to reflex action, and is also distended. There will be complete cessation of intestinal peristalsis. Pneumonia is a further complication. There will be small lobular foci of inflammation, due partly to emboli from thrombosed mesenteric veins and partly to metastases of the peritoneal sepsis. Oliguria, and even anuria, are the results of the diminished amount of water contained in the body, a condition which is frequently associated with albuminuria because of the damage to the kidney epithelium.

Diagnosis.—The diagnosis is easy when the history shows that there has been a previously movable hernia which has suddenly become immovable, combined with the appearance of the above acute symptoms. When these symptoms are absent, the difficulties may be great indeed, and even the most experienced surgeons may err. The gravest error is to assume that there is no strangulation when such is really present and remains inactive. The error of operating without finding strangulation is less to be feared, because, provided the technic is good, the patient is very liable to profit. In cases in which there is doubt about the diagnosis one should always proceed as if a strangulation existed; and if one does not adhere to this hard-and-fast rule, he will sooner or later meet with disaster. The examination should be methodical and thorough, and one should never overlook the fact that several ruptures may be present at the same time. Many cases have been reported in which an irreducible but not strangulated hernia was operated upon, and on autopsy a strangulation was found elsewhere.

Even the region where it is unusual to have a hernia should be carefully investigated. The strangulated hernia cannot be reduced, so that the most important thing is to show that the mass extends into the abdominal cavity. The peduncle may allow a certain amount of lateral motion, but motion upward and downward will be extremely limited. When the hernia is deep seated, so that there is no mass to be felt, increased resistance and localized pain are of importance, as will be considered in connection with Obturator Hernias.

The results of percussion are not reliable. The strangulated intestine is frequently emptied or contains no gas, or the gas is not noticed on account of the large amount of hernia water. A tympanitic note may be also produced by the gases of decomposition when the intestine has become perforated and when there is fecal suppuration. In these cases, however, there will be as a rule emphysematous crackling on percussion.

The general symptoms are the safest guide to the severity of the condition. Violent vomiting at the onset, collapse, etc., are of more importance than the local findings, especially as in the severe elastic constrictions that shut off the arteries the hernia itself may not be under any great tension. Later will be considered the absence of marked symptoms in severe cases of strangulation of the lateral wall of the intestine. The more insignificant the hernia appears, the more careful should be the examination. One should never be satisfied with probabilities, but should determine the conditions present definitely.

There is no doubt that strangulation of a small omental hernia may also produce severe symptoms: vomiting, fecal obstruction, colic; although the tumor is not under so great tension and the tenderness in the region of the neck is not so marked as in cases in which the intestine is involved. The tumor feels solid, there is less disturbance of the general condition, and if there is fecal obstruction there is as a rule passage of gas. For this reason, one should never consider that the condition is one of strangulated omentum unless the symptoms are slight. Besides, with a hernia that is evident on inspection and is irreducible, there may be an internal strangulation in the region of the hernial ring or at some other place in the abdominal cavity.

There is at times marked similarity between a strangulated hernia and strangulation due to intestinal obstruction elsewhere. The author does not approve of administering opium and washing out the stomach in cases in which the diagnosis is difficult, because this may improve the symptoms for a time to be sure, but does not improve the strangulation. The subjective conditions improve, but this is only too often apt to be followed by a sudden fatal result which shows the error in judgment and the treacherous nature of this method of treatment.

There is considerable difference of opinion as to whether a portion of the wall of the intestine can become strangulated or not. Those authors that deny the possibility of this condition claim that the intestinal tube bulged in the affected region beforehand, and that this bulging increased because of the strangulation, or that the strangulated

portion of the wall was held firmly to the hernial sac by adhesions. These hernias are almost always small and have narrow rigid openings. They are found chiefly in the femoral region or in the obturator region, rarely in the inguinal region. Generally, there is no history of previous hernia. During some exertion, such as straining or lifting, or coughing, a small swelling appears that produces marked symptoms. If only a small portion of the gut is caught, there may be sufficient lumen left to allow the fecal contents to pass, so that there are no symptoms of complete intestinal obstruction. The damage done to the nutrition of the intestinal wall, however, may be considerable, and gangrene develops rapidly. As a rule the intestine is the only structure contained in the sac, although occasionally a piece of omentum is found. On operation a bulging of the lateral wall of the intestine may be discovered which resembles a diverticulum. The wall of this area is thickened and firm, which is rather suggestive of the condition having existed as a diverticulum for some time previous to strangulation. It may be that the lateral bulging of the wall has existed for some time, but there is no doubt that in certain cases the condition develops at the same time that the symptoms of strangulation appear. Trzebicky reports a case in which a circumscribed diverticulum disappeared within fifteen minutes after the strangulation had been reduced. It can therefore have existed for only a short time, although it is difficult to realize how this condition developed. The constriction of the wall of the gut is followed by transudation and serous infiltration of the neighboring portion of the intestine, which still further fixes the gut in place. This swelling may diminish the size of the lumen of the portion of the gut not involved, and there may be secondary obstruction to the passage of feces. It is well known that in these ruptures that are so liable to become gangrenous that the symptoms of intestinal obstruction are not apt to be well defined, and that the danger is not recognized. The severity of the onset and the initial strangulation shock is of especial importance in these cases.

STRANGULATED OMENTUM.—The mechanism is the same as that considered in connection with the intestine. The piece of omentum that becomes caught swells on account of the disturbed circulation, and thrombosis or gangrene with inflammation in the sac is apt to develop. The symptoms do not appear so rapidly as those in connection with the intestine, because the vessels are more or less protected by the fat and there are no intestinal bacteria to be dealt with.

The symptoms are not so marked, although there is almost always intense pain at the onset, not only in the hernia itself, but in the abdomen, especially in the epigastric region. The hernial swelling becomes larger, firmer, sensitive to pressure, and is dull on percussion. On palpation it may be possible to detect the dense nodes of omentum until the amount of hernia water makes this impossible. Vomiting is not uncommon at first, but the movements of the bowels and the passage of gas are not interfered with. The general condition remains