little I can to commemorate the hero, and therefore I give his account here in full:

"We had to send to Valdivia for chloroform—four days' journey. In the meantime I occupied myself in preparing the patient, in considering with what instruments I was to perform the operation, and selecting and instructing my assistants. The instruments were a trocar made from a piece of colhuihue[1] about ten inches long, hollowed out, and sharpened to a point at one end, and at the other connected with a piece of india-rubber tubing from an enema syringe; the instruments from a 'Charrière' pocket-case, and a pair of craniotomy forceps. The assistants were a Catholic missionary, two Indians, and a half-blood. The ligature was made of raw-hide, with two pieces of wood fastened at the ends, in order that more power could be used in pulling it tight, and at the time of using it was to be dipped in warm neatsfoot oil.

"The pedicle was rather long, but flat; the raw-hide ligature was applied to it, and tightened by means of the two pieces of wood pulled by the two assistants on each side of the body until it was almost buried in the parts, and then made fast with two lasso-knots,[2] the ends cut off, and the whole dropped into the cavity. The cavity was mopped out with cotton-wool, and the wound closed with fine iron-wire sutures, pushed through from within outward and twisted, and a superficial continuous suture of silk. Water-dressing was next applied, and a warmed bayeta flannel roller passed twice round the body. Consciousness returned before I could get her off the table, owing to the priest not attending to the chloroform, being too occupied and astonished at my movements; in fact, throughout the whole proceedings I had constantly to attend to the pulse. Great exhaustion followed; and I had first to administer warm wine-and-water, and afterward warm whiskey-and-water, apply friction to the extremities, until, finally, at five o'clock in the afternoon, she had improved very much, with a pulse at 115, and the surface warm and moist. My thermometer was broken, so I could not note the temperature. I remained in the neighborhood twelve days to attend to her, during which time she went on well, with the exception of a little vomiting the day after the operation, owing to the husband giving her warm lamb's blood without my knowledge. The first pair of sutures were removed on January 28th, and so on, day by day, one or

[1] A species of bamboo.

[2] One on each side—*i. e.*, one tied first, and then the ends carried round to the opposite side; a slit made in one end, and the other cut in the form of a knob, which passes through it, thus preventing slackening through swelling.



more was removed, until the ninth, or middle one, was taken out.

"Never having seen the operation, nor read any special work on the subject, I had nothing to direct me but the short account given in the last edition of Dr. Tanner's 'Practice of Medicine.'"

Occasionally we are called upon to deal with an ovarian tumor in a woman who is pregnant—a complication which may or may not be discovered before the operation. Some years ago the question of the propriety of removing an ovarian tumor in a pregnant woman was discussed before one of the medical societies, and various opinions were given. By some obstetric physicians the opinion was expressed that it would be better to induce premature labor, and that after the patient had recovered from this, we should perform ovariotomy. Mr. Spencer Wells and myself, on the other hand, contended that it would be much better to perform ovariotomy, and leave the pregnancy alone, and this plan has now become the accepted practice. At that time Mr. Wells had operated upon ten pregnant women, and nine of these cases were successful. I do not know what his experience may have been since, and I have not found any record of the experience of any one else upon this subject; but since the discussion I have operated upon ten pregnant women with uniform success. Before that time I had only operated in one such case. The result was fatal, and was undoubtedly due to the use of the clamp, for the cause of death was gangrene of the pedicle. I do not now think pregnancy offers any bar to the operation. In all of my cases I have been able to recognize the pregnancy before I opened the abdomen; but I can easily imagine that it might occur to the most experienced surgeon to operate on a woman in whom he had not previously recognized the existence of the complication. Indeed, Mr. Wells tells us of a case in which he punctured a pregnant uterus with a trocar, having mistaken it for a cyst. He opened the uterus, emptied it of its contents, and the patient recovered.[1] This is one of the complications, therefore, to be especially borne in mind. The usual color and appearance of an ovarian cyst is as a rule sufficiently characteristic to make it easily recognizable from a pregnant uterus; yet I can easily imagine circumstances such as Mr. Wells encountered, that would lead to such a mistake; and should this misfortune happen, the bold proceeding he followed would certainly be the best practice.

We not unfrequently find tumors of the uterus associated

[1] A similar accident happened to Dr. Byford, of Chicago, and he successfully followed out the same practice as did Mr. Wells. (American Journal of Obstetrics, January, 1879.)

with cystic disease of the ovaries. It has happened to me very frequently to find a very large part of the mass which I believed to be entirely ovarian formed of a uterine myoma associated with an ovarian cystoma. Under such circumstances the practice now universally adopted is to remove the ovarian tumor and leave the uterine mass alone, but formerly it was regarded as the correct practice to remove both. Further on I shall deal again with this important subject, but here I will say it is my uniform practice now, when I find a uterine myoma in existence as well as an ovarian tumor, to remove both ovaries and tubes, as in this way we can arrest the growth of the tumor we cannot remove; indeed, in some of my cases the tumor has entirely disappeared.

One of the most interesting additions to our advances in abdominal surgery is that originally derived from an operation performed by Dr. Wiltshire, who removed an ovarian tumor from a woman suffering from symptoms of the utmost gravity, due to peritonitis and gangrene of the tumor. The case is described in the "Transactions of the Pathological Society" for 1868, the operation having been performed in May of that year.

Rapid increase of the tumor had taken place, and there were symptoms of the most urgent kind present. Vomiting had been incessant for three days, when, after unusual exertion, rapid enlargement of the tumor had begun. The pulse was quick and feeble, the extremities blue, and the patient's general condition one of collapse.

The extreme tension of the abdominal parietes was shown by the way in which the tumor shot up into the wound directly the incision reached the peritoneal cavity; it had also rotated. Blood escaped on puncture, and at one place the cyst wall gave way when touched, owing to extreme thinness. The pedicle was rotten, and the *right* cornua of the uterus had to be transfixed and tied to arrest hemorrhage.

The tumor proved to be of the right ovary and multilocular, the loculi being distended with blood. It had rotated on its pedicle four days before the operation, strangulation ensuing. The twist was from right to left, and appeared to have given two turns. The pedicle was quite small and short.

I think sufficient praise can hardly be given to Dr. Wiltshire for his courage in performing the operation under such urgent conditions, and it is not too much to say that to his success in this case we owe a new departure in the practice of abdominal surgery by which operations under acute symptoms are undertaken, and, apparently, with results as satisfactory as those obtained in cases free from emergency.



This remarkable axial rotation is an incident in the life-history of ovarian tumors, which has not yet received as much attention as either its importance or its frequency deserves, and, so far as I know, no perfectly satisfactory explanation of the method of its occurrence has been given.

So far as I can find, the first notice of the incident is made by the same author who has written most about it, Hofrath Professor Carl Rokitansky, who describes it in his "Handbuch der Pathologischen Anatomie" (vol. i.) in 1841. There the description is not full, but it is certain that he had then seen it, and in his future papers he tells more about it than does any other author; indeed, most other writers have taken their descriptions from him with more or less acknowledgment.

I have found reference to a note of a paper by him in the *Allgemeine Wien Medizinische Zeitschrift* for 1840, but have not been able to find the original paper. Possibly the note in question is a misprint, though the title is given in full, "Ueber Abschnerung der Tuben und Ovarien und ueber Strangulation der Letzeren durch Achsendrehung."

Rokitansky has also written very full papers in the *Allgemeine Wiener Medizinische Zeitung*, 1860; in the *Zeitschrift der K. K. Gesellschaft der Aerzte in Wien*, 1865; "Ueber der Strangulation von Ovarialtumoren durch Achsendrehung."

Dr. Van Buren narrates two cases in which he noticed the twisting of the pedicle of an ovarian tumor, in the *New York Journal of Medicine*, 1850 and 1851.

In the first the tumor was on the left side, but the direction of the twist is not given. The twist had not strangulated the tumor, and did not hasten the ovariotomy, which was successful.

The second case was one in which acute peritonitis was diagnosed on August 28th, and the patient died on September 8th. On post-mortem examination the tumor was found very dark in color, almost black. It was a tumor of the right ovary, but the direction of the twist is not stated. "The twisting of the pedicle interrupted entirely the circulation, the tumor thus became engorged with blood, thence peritonitis, followed by enteritis, causing death." The tumor had made one and a half revolutions only, the pedicle being short.

Dr. Patruban (*Oesterreiches Zeitschrift für practische Heilkunde*, 1855) publishes a case where the torsion produced rapidly fatal intracystic hemorrhage.

Dr. Crome, of Brooklyn (*American Medical Monthly*, 1861), had a case where the strangulation occurred twenty-four hours before labor in a small tumor, the patient dying of peritonitis

on the fifth day. The accident was indicated by the access of agonizing pain in the left side. The cyst was found ruptured and in a state of gangrene.

In his book on "Diseases of the Ovaries," Mr. Spencer Wells mentions that, during his first five hundred cases, he found the pedicle twisted in about twelve cases, but no mention is made of any of the tumors being consequently gangrenous, or that the operation was thereby hastened.

In the *Archiv für Gynecologie* for 1878, Dr. Veit, of Berlin, quoting Schroeder, says, that in his 94 cases of ovariotomy, axial rotation was observed 13 times, and Olshausen is of opinion that the tumors are generally non-adherent.

Dr. St. John Edwards, of Malta, has published a case in the *Lancet*, of October, 1861, in which he had recognized an ovarian tumor during the lady's first pregnancy. Her second labor occurred prematurely, sudden abdominal pain supervened on the second day after, and she died on the fourth. The tumor was found to be of a livid purple color, with patches of extravasated blood, and rents in its walls. The right ovary was flattened out on its under aspect (so that it must have been a parovarian cyst). The pedicle was two inches long, and had been twisted one and a half times round. It was intensely congested, and the ovary was full of dark extravasated blood (closely resembling one of my own cases). There was no peritonitis, and the tumor was absolutely free from adhesions. The contents of the sac were claret-like. He attributes the twisting to the expulsive action of the uterus, though the accession of pain was not till about forty-eight hours after labor.

In the *Edinburgh Medical Journal* I published the following case, which I desire to reproduce here, as it was the first of my experience of this remarkable accident:

On August 18, 1868, I was called in consultation by my friend, Mr. Lorraine, of Wakefield, to see Mrs. C——, aged forty-eight, who was suffering from a strangulated femoral hernia. I found the tumor of small size, that the symptoms had existed only two days, and that it was irreducible by the taxis under chloroform. I suggested a full dose of belladonna and a delay of six hours. At the end of that period I again tried the taxis under chloroform, but without being able to reduce the hernia, so I at once performed Gay's operations, divided Gimbernat's ligament freely, and without any trouble succeeded in returning the bowel.

At 7.30 on the morning of the 19th she was much relieved, free from pain, and the vomiting had quite ceased. Opium was



administered freely, and iced brandy-and-water or Moselle *ad libitum*.

August 20th, 8 A.M.—The abdomen was slightly tympanitic, and the pulse about 140, the patient being free from pain and sickness. 8 P.M.—Tympanitis increased; ordered a turpentine stupe.

August 21st, 8 A.M.—Tympanitis so extreme that I entertained the idea of puncturing the intestines. Temperature in axilla, 101.6°; no pain or sickness, and she takes beef-tea and stimulants freely; face very anxious in expression. 10 P.M.—Mr. Lorraine had seen her in the afternoon, and reported that she was somewhat better. When we met we found that the distention was much less; there was no pain and no narcotism, as the opium had been intermitted; rectum examined per vaginam, and found quite empty; temperature in axilla, 101°.

August 22d.—In the forenoon she had two moderately sized and very offensive stools; in the afternoon she was seen by my friend, Mr. Kemp (in whose practice the case occurred), who noticed, and remarked to me afterward, that the breath had the hay odor. At 10 P.M. I saw her with Mr. Lorraine, and we both noticed the musty smell of the breath. She was sinking then, and died at 8 A.M. on the morning of the 23d.

Twelve hours after death I made a post-mortem examination, with the kind assistance of Mr. Lorraine and Mr. J. Kemp. The wound made to relieve the strangulation had healed by first intention. On opening the abdomen I found the small intestines much distended with flatus. The sac of the hernia was empty and uninjured. On separating the intestines a black gangrenous mass was observed lying in the concavity of the right ilium. On passing my hand round it I discovered that it was a small ovarian tumor, consisting of two equal-sized cysts, one of which was totally gangrenous, and so soft as to break up with the most gentle handling, and discharge into the cavity a quantity of dark fetid serum; the other cyst was partially gangrenous. The tumor measured about eleven inches long and four inches in its greatest diameter, and it had a constriction between the two cysts. Its base was slightly glued to the brim of the pelvis; but, with this exception, there was no peritonitis. The tumor lay across the transverse diameter of the pelvis, the left end being buried in the pelvis, while the right lay over the brim on to the ilium. It was the right-hand cyst which was totally gangrenous.

When I passed my hand down the pedicle I found that it was long and thin, and twisted on itself, feeling more like an injected umbilical cord than anything else with which I am acquainted.

I remarked to my colleagues that the pedicle was twisted, and, keeping it in my left hand, with my right I slowly untwisted it, by rotating the tumor until the pedicle was straight. To do this, I had to alter my grasp of the tumor nine times; that is, the pedicle had been twisted by four and a half revolutions of the tumor. It was the right ovary which was diseased (and the twisting was from within outward toward the right side, as far as my recollection now serves me).

Concerning this case, I have ever since had a suspicion that my operation for hernia was an unnecessary one, and that all the symptoms were really due to the gangrenous tumor. If this were really so, I have the consolation that I did my patient no harm.

When this case came under my care I had never heard of the accident, indeed it occurred nearly twelve years ago, and my experience of ovarian tumors was somewhat more limited than it is now. It made a deep impression on me, however, and I resolved if ever I met with such symptoms in another woman, and could discover the presence of a tumor, I should not hesitate to attempt its removal. This determination I have been able to carry into effect on nine occasions with perfectly successful results. Of course, I cannot but regret that I did not recognize the existence of this tumor when I had the patient under chloroform, as I think I could do now with my larger experience in abdominal surgery, though, perhaps, my youth and inexperience at the time form a barely sufficient apology.

The next case I find on record is one published by Dr. Barnes in *St. Thomas's Hospital Reports* for 1870, where Mr. Spencer Wells, Dr. Tyler Smith, and Dr. Oldham had all recognized the presence of an ovarian tumor. Dr. Barnes saw her on August 26th, and on September 2d, when the diagnosis of pregnancy, in addition, was made. On the 25th there were all the indications of mischief in the cyst, and Dr. Barnes discussed the question, "Has the extra-uterine cyst ruptured?" On that day a premature fœtus was expelled, and she lingered on till October 4th without any attempt at surgical interference.

At the post-mortem "a cyst came into view, dark-colored, stained with blood in several points, having extravasated blood clotted in its walls. In places it was found very fragile; it had twisted twice axially from right to left during life."

I do not think there can be a doubt that if this case had been operated upon, as it might have been, seeing the tumor had been recognized, the patient would have recovered.

A still more curious case is related by Dr. Barnes in the same paper, where the symptoms of strangulation were taken for those of labor, and where, on post-mortem examination, he says he found an ovarian tumor entirely free from adhesions, with its pedicle twisted twice into a rope, the appearances of gangrene being conclusive. Such a case would be just such a one in which ovariotomy would be, and has been in my hands, successful.



At a meeting of the Dublin Pathological Society, December 4, 1879, Dr. Kidd showed the preparation from a woman whom he had had under his care in the Coombe Hospital, and who had died under circumstances which clearly pointed to something wrong in a tumor which had been recognized some months before. The preparation was that of an uncomplicated ovarian tumor, with twisted pedicle and consequent gangrene. "There was a complete turn upon the pedicle; this had strangulated the tumor, and thus gave rise to the black appearance, and the woman died from irritative fever, produced by strangulation and sphacelation of the morbid growth." This is another case where I think there is cause for regret that an attempt at removing the tumor was not made. From the experience I am about to give of my own practice, I think there can be little doubt that the rule will be established that if the existence of an ovarian tumor has been, or can be recognized, and symptoms should set in which are of a serious kind, and can be referred to strangulation of that tumor, an exploratory incision should be made, and the tumor removed if possible, especially if it be found to be the seat of the mischief.

During 1879 I had the remarkable occurrence in my practice of three cases of gangrene of ovarian or parovarian tumors, due to axial rotation.

The first case was sent to me by Dr. Faussett, of Tamworth. She was forty-six years of age, her last confinement was four years before, and her menstruation was normal. I saw her first in March last on account of a small tumor, which I diagnosed to be monocystic, and probably parovarian. I advised her to defer any operation till it was larger. She returned on June 9th with the tumor greatly enlarged, and suffering from intense abdominal pain. Her face had a peculiar anxious expression, and her temperature rose to 39° C. at night. I therefore recommended the immediate removal of the tumor. On opening the abdomen I found the cyst of a black pearly color, universally adherent by recent lymph, its contents quite black, and its walls black, gangrenous, and in places quite rotten. The pedicle was twisted three or four times, and at the point of maximum constriction it was only as thick as an artist's pencil. I tied it just

below this point. After the operation she had no pain, the temperature never rose above 37° C., and she made an uninterrupted recovery. The right ovary was involved in the gangrene, but it was free from the tumor. The rotation had occurred from within outward to the right. The operation was performed without any of the Listerian antiseptic precautions.

The second case occurred in a patient from Sheffield, placed under my care by my colleague, Dr. Edginton. She was thirty years of age, had been married ten years, but had never been pregnant.

She had noticed a gradual increase in size for nine months previous to my seeing her. Sudden and violent pain in the abdomen occurred on the 4th of November, followed by incessant sickness. When I saw her on the 11th the diagnosis of an ovarian tumor was simple, and her anxious appearance, the green sickness, feeble pulse, and the intense pain, all pointed to the probability of strangulation of the tumor. I therefore admitted her at once to the hospital, and removed the tumor next day. It was found to be uniformly adherent to all the tissues in contact with it, the adhesions being recent and easily overcome, but they gave a great deal of trouble from free and abundant hemorrhage. This was controlled chiefly by the application of solid perchloride of iron to the bleeding points. The tumor itself was a multilocular cyst of the right ovary, of a uniformly dark purple color, extremely friable, having large extravasations of blood in the walls, and especially at the base, close to the pedicle. The pedicle was very short, and was twisted twice completely round, from within outward and to the right. The operation was performed with complete antiseptic precautions, but the temperature and pulse curves show that she made anything but an antiseptic recovery. The pedicle was secured by the Staffordshire knot. She left the hospital on December 14, 1879.

The next case occurred immediately after that just narrated. She was thirty-six years of age, had had children, the last four years ago. She had not menstruated for seventeen weeks, but had noticed an increase of size so rapid that it could not be explained by ordinary pregnancy. I saw her for the first time on November 10th at the out-patient department, and though the diagnosis was difficult on account of the patient being very fat, I made out early pregnancy and an ovarian tumor.

She came back on November 23d complaining of intense abdominal pain, which had come on suddenly two days before, followed by incessant sickness. She looked very ill, and vomited green matter while in the consulting-room. I at once sent



her into the hospital and called an emergency consultation with my colleague, Dr. Savage. He agreed with me that it was a case of pregnancy, with a strangulated cyst, the only argument against this view being the apparent absurdity of my having two such cases in the hospital at the same time, and the likelihood that our recent experience should lead us into too ready a diagnosis. However, we stuck to our view, and agreed upon immediate operation. This I performed, and found the case to be exactly as I had diagnosed. The uterus was occupied by a pregnancy of about the fourth month, and the tumor was a par-ovarian cyst of the right side, of a pearly black lustre, the ovary lying on its front in the line of incision, at least ten times as large as an ordinary ovary, being four inches long and two broad, the enlargement being due entirely to extravasation of blood in its tissue. The Fallopian tube stretched over about a third of the circumference of the tumor, running down toward its twisted pedicle, of which it formed part. In the wall of the tumor, and especially at its base, were effusions of blood. The contents of the tumor were straw-colored, but viscid. The tumor had made three complete revolutions from within outward and to the right side. There were no adhesions, and the operation presented no difficulty, and it was carried out with complete Listerian antiseptic precautions. She made a better recovery than the second case, but not so good as the first, to which it really had a very close resemblance. No symptoms of miscarriage showed themselves. She left the hospital on December 21st, and her pregnancy was satisfactorily terminated.

One feature which was characteristic of all three of these cases, and which I have omitted to mention in connection with the second, is that the abdomen undergoes a very rapid and unusual increase in size for a few days before, or coincident with, the access of the violent pain. In two it was noticed to have occurred to a marked degree before pain was felt, and this we may easily believe to be the stage of strangulation productive of œdema and precedent to that of gangrene. This points to the conclusion that the rotation is gradual. I have had six other cases in all of which the leading features were identical with those narrated.

The symptoms recorded in all these cases are closely alike. The chief feature is the sudden accession of severe abdominal pain and tenderness, followed immediately by vomiting, which soon becomes green. The pulse rises, but the temperature does not always do so. These symptoms in the recognized presence of an abdominal tumor which may be ovarian, should lead at once to abdominal section, and they would do so in my practice,

whether the tumor were ovarian or not, if there seemed to be any probability of its being possible to remove it.

As to the mechanism by which this singular rotation is produced, we may at once dismiss any explanation which attributes it to the condition of the tumors themselves, for we find it occurring in tumors of all kinds, large, small, smooth, and globular, multicystic and irregular, parovarian, ovarian, dermoid, and solid fibrous tumors, the only intrinsic conditions of the tumors being that they should be free to move, and have pedicles capable of being twisted.

Unfortunately, in the majority, or at least in a very large number, of the cases, the direction of the twist is not clearly stated, or not given at all, nor is the side on which the tumor grew clearly given.

Of the cases narrated by Rokitansky, the great majority, about four-fifths, were tumors of the right side, and in a still larger proportion the twist was from the left to the right side—that is, taking the vertebral column as the starting-point, the twist travelled to the left side, and then forward and over to the right, that being what I read as his "und ebenso kommt die Drehung nach aussen weitans häufiger vor, als jene nach innen," though it is by no means certain that my rendering is correct.

Certainly, in all of my own cases the tumor was on the right side, and the twisting in all those operated upon was as I have just described, and in the first case I have given my recollection as that it was in this direction also. It is not recorded so in my notes, however, and my memory may be in error, though I think it is likely to be correct, as the case made a more profound impression on my mind than, perhaps, any other incident in my surgical experience.

If we had exact statements on these points for a large number of cases, I think we might arrive at some conclusion as to the cause of the rotation.

In a few of the isolated cases explanations are given which seemed more or less possible to the narrators, but they do not bear the examination of extended experience. To two of these I have already alluded, and only a third requires to be mentioned. Dr. Barnes hazards the explanation that "the tumor being free from adhesions, and tolerably firm, may *roll over on its axis*. This may happen from the enlargement of the uterus tilting it over, or from over-exertion, when, one part of the tumor being more pressed upon than the opposite part, it rolls over." The part of this explanation which applies to cases where the rotation occurs in association with a pregnant uterus applies



only to a small number of the cases, even if it were sufficient, which I do not think it is, and therefore may be dismissed. The rest of the explanation simply amounts to a repetition of the fact that this singular phenomenon does occur, and is no explanation at all.

The only reasonable effort to explain the incident has been made by Klob, who has made some experiments, from which he concludes that it is the alternate filling and evacuation of the bladder which rotates the tumor. I have not been able to find the original paper, and am, therefore, unable to criticise the basis of his opinion, but on *à priori* grounds I think there may be something in his idea. But before I knew of this explanation, and entirely from my own cases, I had come to the conclusion that it was the alternant filling and emptying of the rectum which caused the rotation, and it is possible enough that the bladder may help. That the bladder alone should do it is, I think, unlikely, for being central its influence would be, in all probability, neutral. If it were the rectum, then this force acting on the left side of the point of rest, the vertebral column, would inevitably push the tumor in the direction in which, in at least nine out of ten of my cases, the movement took place; and it would certainly act more readily on right-side tumors than on those of the left side, for the former are anchored so that the pushing force of the rectum will be in the requisite oblique direction, in the plane of a screw, and very nearly at right angles to the axis of movement.

If I might venture to apply a dynamical illustration to pathology, I would say that an ovarian tumor growing on the right side with a free pedicle, and resting, therefore, with its axis inclined toward the top of the ninth or tenth rib on the left side, would be in the condition of a body having freedom of the first order—that is, free to rotate about a fixed axis, but not to slide along it. To such a body a screw, in the form of a wedge, would be applied by the rectum in the most favorable of all directions, in a direction obliquely from above downward, across the axis of freedom and below the equator of the moving body. Every piece of fæces which passed into the rectum, especially in the recumbent position of the patient, would act as a wedge to drive the tumor round. In obedience to the dynamic law, that by a successive repetition of the process an indefinite quantity of energy may be produced, however small the initial force may be, we have at once the explanation of the phenomena of many of these cases, notably of that published by Mr. Thornton. We have, in fact, this process of rotation going on slowly until the point of strangulation has arrived, when the sudden access of pain for