A NEW SIGN IN THE DIFFERENTIAL DIAGNOSIS BETWEEN TORSION OF THE SPERMATIC CORD AND EPIDIDYMITIS

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Delasiarve in 1840 probably reported the first case of torsion of the cord. About 200 cases have been reported in the literature since that date. It is rather difficult to arrive at an exact figure; for example, Campbell refers to 120 cases prior to 1920 adding an additional 7 to his own. O'Conner in 1919 reports 124, Kretschmer in 1930 reports 135 including his case and Wallenstein in 1927 enumerates 150 cases in the literature. It is reasonable to assume that this condition occurs more frequently than the textbooks lead one to believe.

The etiology is as confusing as the number of cases reported. Practically all the past writers agree that some congenital malformation of one form or another is observed in the operated and studied cases. Uffreduzzi, Lecor, Nicolandi and Owen state that a testis normal in its attachments cannot undergo torsion. Eccles enumerates predisposing causes as: (1) imperfect descent of the testis, (2) an abnormally long mesorchium, (3) practical absence of mesorchium, (4) action of gubernaculum testis, (5) congenital twist of the cord, (6) a redundant tunica vaginalis, (7) a flattened condition of an imperfectly descended testis. Ormond adds an unusually loose scrotum. Ormond, Eve, McAdam, Eccles, Kerth and Edington observe an abnormal attachment of cord to testis. Curling considers the chief factor a defective formation or abnormal attachment of the middle strand of gubernaculum; therefore no fixation of the lower position of the testis to the scrotum. Langenstein believed torsion due to an abnormally broad and flat cord, what he termed “a long mesorchium or a floating testicle.” Uffreduzzi and Johnson believe that torsion is always brought about by action of the cremaster muscle. Nicolandi describes a complete absence of mesorchium. Kocher called attention to the bifurcation of the cord. Englisch brings up the condition of thrombosis of the veins of the pampiniform plexus. LeGae and Fournier advance the theory of a lack of epididymo-testicular adherence;
Scudder and Corner believe a long mesorchium responsible; Weitz believes the condition due to free mobility of the testis and stretching of the mesorchium; Rigby and Howard consider the predisposing factor to be an elongation of the globus minor. There are many other suggested factors.

The direct causes offered are extremely numerous. The cases of Whipple, Keyes and Campbell came on after a strain; of Von Meyer, Czerny, after sneezing; of Johnson, while blowing a cornet; of Nash, after boxing; of Barker, after straining at stool; of Owen, after bowling at cricket; of Keen, Davis, Culley, Page, Anders, Lexor, Van der Pool and Scudder, during sleep; of Nicolandi, after heavy lifting; of Scudder, after playing baseball; of Weitz, while playing football; of Hamilton, while descending a ladder; of Kretschmer, while skylarking; and of Scudder, another case while walking. Numerous cases came about without any apparent cause. Kretschmer states "there is no factor, or group of factors which is present in each and every case although certain predisposing factors may be found in a large group of cases." This glimpse of accumulated opinion only briefly exemplified above certainly impresses one that no one definite factor or simple group of factors can explain the etiology of this affliction. The etiology is therefore of little assistance in the prevention, diagnosis and treatment of this condition.

Thomson and Walker state that 70 per cent occur before the age of twenty. Keyes, Collings, Campbell and Scudder believe 75 per cent occur before twenty. It is apparent that approximately two-thirds of the cases occur before the age of twenty. Taylor reports a case four hours after birth. Lexor reports a case at sixty years of age; therefore it can occur at any age.

Wallenstein reports 150 cases from the literature of which 90, or 60 per cent, were right-sided; 60, or 40 per cent, left-sided; or a ratio of three to two. Davis states two-thirds of all cases are on the left side. Rigby and Howard report 40 cases collected of which 22 were on the right side and 18 on the left. O'Connor states 70 cases were on the right side and 54 on the left side. Davis states that two-thirds of all cases are on the left side. It appears that torsion of the right side occurs three times to twice on the left side.

Wallenstein reports 60 cases in descended and 90 in imperfectly descended testes. Kretschmer states that 47 per cent are partially or completely undescended. O'Connor says 52 cases descended, 72 incompletely descended with 3 cases intraabdominal. Owen and Campbell state that one-half of the cases give a history of imperfectly descended testicles on the affected side.

The onset of symptoms is usually sudden, the severity depends on the tightness of the twist. The pain is usually at the site of the torsion and may radiate along the cord to the groin or to the testicle. It may be excruciating or moderately sharp in character. The duration of the pain may be only a few minutes or a few days. It usually subsides in a few days, however, but the tenderness and swelling last for a long period. Lowesley states "the symptoms are in the main those characteristic of epididymitis, for which condition it is often mistaken." Campbell states "it is impossible to distinguish torsion of the testicle from acute epididymitis in the early stages." The 2 cases reported in this article were admitted to the hospital by internists with a diagnosis of acute epididymitis and in the first case the possibility of a strangulated hernia was considered by the surgeons.

It has been my experience in the treatment of hundreds of cases of acute epididymitis that when the scrotum is elevated with the Blockley bandage as suggested by Pelouze or the Bellevue suspensory bandage, immediate relief of the acute symptoms occurs, and frequently the patients get out of bed to walk about or resume their normal activities. Because of this experience I came upon a new sign which in both cases was the differential point and deciding factor in changing the diagnosis to torsion of the cord resulting in the necessary operative interference. In these 2 cases and in others that can be cited from the literature, from the case histories; for example, case 1 of O'Connor's, "a patient of thirty-one years of age where a family physician told him he had inflammation of the testicle and advised him to remain in bed with the scrotum elevated, cold cloths were applied constantly and pain gradually increased during the day," elevation of the scrotum here did not relieve the pain; in fact the pain increased. When tension was put on the cord due to the elevation of the scrotum the pain increased, which logically explains itself, as tension on an inflamed, twisted cord certainly would increase the pain; hence the value of this new sign. Dowden states "epididymitis may be ruled out by the history, examination of the urine, rectal palpation of the prostate and seminal vesicles." Campbell reports 2 cases of gonorrhea which were confusing in the diagnosis. In the second case reported here the patient had a urethral discharge positive for gonococci. It is rational to assume that Dowden's suggested assistance would cer-
tainly be of no avail in these cases and as histories of gonorrhea are only of value when positive and as the majority of these patients are in the age limit for this infection, and as I have had many cases of acute epididymitis where there was no urethral discharge, the urine clear and the prostate and seminal vesicles apparently normal or with a few pus cells in the secretion, these would not suffice. In both cases reported acute epididymitis was ruled out by this positive sign; namely, elevation of the scrotum increased the pain and tenderness and did not give relief as it would in acute epididymitis. The swelling of the scrotum by edema so frequently makes it difficult to distinguish the testicle from the epididymitis which may accompany torsion and then the scrotal contents are not differentiated. Tenderness along the cord may be present with epididymitis. General symptoms like nausea and vomiting with some elevation of temperature may be present in both conditions but is more likely in torsion or better usually more severe. Torsion in the undescended testicle has been ably discussed in other articles. Suspicion should always center on inguinal canal or lower abdominal pain when the scrotal sac on one side or both sides is empty to rule out torsion of the cord. Campbell states "palpation of involved testicle in the inguinal canal from hernia, neoplasm or epididymitis is quite impossible." I believe that in the undescended testicle, with a tumor in the inguinal canal the condition calls for the same treatment, namely, surgical intervention. It is more important to differentiate torsion from acute epididymitis in the descended testis because the treatment here is usually quite different.

The treatment should be surgical; although Nash reports one success and three are reported in Bellevue by untwisting the cord. Torsion may be prevented by plastic correction of the undescended testis before puberty by suturing the organ to the scrotum. In a later period, namely, after puberty, removal is indicated in the partially descended testicle due to the danger of peritoneal injury. In the fully descended, if early, untwist and repair plastically; otherwise, remove.

CASE REPORTS

Case 1. R. E. O., Sea. 2/c. U.S.N., admitted to United States Naval Hospital, Brooklyn, New York, on March 25, 1933, with a diagnosis of undetermined hernia, inguinal, strangulated.

Family history. Mother died at forty with tuberculosis.

Past personal history. Mastoidectomy left, 1927, with complete relief when thirteen years old. Habits are moderate. He denies venereal exposure and the diseases by name, symptoms and signs.

Present illness. "About a year and a half ago while in swimming I landed on a bar between my legs. About one hour later I noticed a swelling in my lower groin near my scrotum. An ice bag relieved the pain after one hour while in bed. About six months later I had a similar attack, and after that I had three other attacks. The last attack came on when taking a cold shower; it, however, became more painful with some nausea and vomiting. It was relieved by the doctor with morphine. I was then transferred to the hospital." The pain was sharp in character, localized to the left inguinal region and upper scrotum; its sharpness is gradually subsiding as he is quite comfortable in bed at the present time. No nausea is present. His temperature 99°, pulse 80, respirations 20. The bowels are regular. Urine is clear. There is some reddening and edema of the anterior scrotal skin. The left testicle is retracted higher than the normal right. There is a tender tumor mass in the lower inguinal region along the cord. The "Prehn sign" is positive. The scrotal contents are not definable due to the swelling and edema, the scrotal contents are about three times the size compared with the right. The blood Kahn is negative. The blood count is normal. Rectal examination elicits no pathology, the prostatic secretion appears normal with about 8 pus cells per high power field.

He was operated on March 31, 1933, under regional anesthesia. A scrotal incision was made discovering a thickened tunica about 1 cm. thick with a dusky epididymis and testicle. The spermatic cord was flabby, darkened and about 5 cm. from the testicle a definite kink was seen. The cord appears normal above. The entire mass was removed below the normal cord, and the skin closed with a small drain.

The patient's age is eighteen years. He made an uneventful recovery.

Gross pathological report. Specimen consists of a testicle epididymis and distal portion of vas in the tunica. The tunica albuginea is moderately thickened about 1 cm. in thickness. The tunica albuginea is blue in color, moderately congested. The surface of the testicle is light brown with a hemorrhagic appearance. The central portion and the portion nearest the epididymis are mottled red and slate-colored, suggestive of hemorrhage into the parenchyma. The lower portion of the epididymis shows some hemorrhage. The upper portion appears essentially normal on section. The cord shows edema and hemorrhage into the connective tissue. The vessels are turgid and black in color.

Microscopical description. Sections of the testicle show extensive necrosis of all elements and hemorrhage into the interstitial tissue around the necrotic areas. Numerous small groups of inflammatory cells and proliferating fibroblasts are noted in these sections. Sections of the epididymis show a chronic
inflammatory reaction, also an infiltration of fibroblasts throughout. A few small arteries show a thickening and narrowing due to intimal proliferation. A few small groups of striated muscle are undergoing degeneration. Areas of necrosis are apparent here also.


Case II. C. J. N., Sea. 1/c. U.S.N., aged twenty, admitted to the United States Naval Hospital, New York, on April 25, 1933, with a diagnosis of gonococcal infection of the epididymis.

Family history. Parents living and well.

Past personal history. Usual childhood diseases. Habits regular. Denies syphilis by name and symptoms. Exposure three months ago in New York City, used a condom and used prophylaxis one hour after exposure.

Present illness. Last exposure three months ago. A urethral discharge appeared six days ago or 84 days after last exposure followed by a rather acute right scrotal swelling which reached its maximum degree on the second day. He believed this followed an undue straining with heavy lines. He treated his urethra himself. He had no general symptoms such as nausea, vomiting or fever; however, he did feel some lower back dull pain. He has a profuse urethral discharge which is positive for intracellular diplococci. The right scrotal skin is somewhat reddened and thick. The right scrotal contents are enlarged about five times compared with the left, and is round, globular in consistency, slightly tender, with a positive "Pregnancy" sign. Rectal examination elicits a slightly tender prostate with some induration, the seminal vesicles are slightly tender and indurated. Temperature 101.4, pulse 84, respirations 18. Urine first glass cloudy, second glass hazy. Blood Kahn 3 plus (234) on May 15, 1933. Blood count normal.

Operation. Under regional anesthesia the scrotum was opened. The tunica was about 1 cm. in thickness extending well up along the cord. The epididymis appeared small and necrosed. The testicle appeared gangrenous. The cord was amputated high up, the contents removed and sent to the laboratory. The skin was closed with a small drain. The patient made an uneventful recovery.

The pathological report described a necrosis of the epididymis and testicle with some involvement of the cord. A kink or torsion was noted in the cord about 7 cm. above the testis in the gross specimen; otherwise the report was the same as the detailed one reported above.

The patient remained for anti-leuко therapy and was then discharged from the hospital to continue this treatment. No evidence of syphilis could be found on reexamination of the pathological specimens.

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THE STAINING AND MORPHOLOGY OF THE HUMAN SPERMATOZOA

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The present study on the staining of human spermatozoa has been initiated as a portion of a program to determine whether individuals responsible for the propagation of hereditary abnormalities exhibit in their germ plasm detectible pathologic changes with greater frequency than is met with in the germ plasm of normal individuals. Further, it was hoped that a more intensive study of the germ plasm, particularly the mature spermatozoa, would elicit information useful for infertility studies—a field in which the study of seminal micropathology has already attained a recognized value. The studies have been made possible through a research fund provided by the Department of Mental Diseases of the Commonwealth of Massachusetts.

Most clinical observations upon spermatozoa have in the past been based on motility studies, the results of which are markedly influenced by personal equation and various other factors that are not readily brought under the control of the observer. When, however, morphologic changes furnish the basis for appraisal of spermatic health, observations are much less subject to the uncontrolled variants. For such observations, fixed and well stained preparations are indispensable. In perusing the literature on the subject, we have been unable to find any suitable method previously described. To obtain a clear image of the spermatozoa it is important to treat semen smears so that its mucous content does not stain and cloud the image of the spermatozoa. This we have accomplished either by removing the nucleus with a solution of Chlorazene before staining; or by means of a staining technique which leaves the nucleus unstained. So treated, spermatozoa may be studied, measured and photographed under magnifications as high as 3000.

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