

## TORSION OF THE SPERMATIC CORD IN INFANCY

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THE infrequency with which torsion of the spermatic cord is found in infancy leads me to report the three following cases operated upon by me at The Babies Hospital in 1928. The only case previously reported from The Babies Hospital was operated upon by Doctor Farr in 1911. The three following cases were admitted within a period of ten weeks. In 1901 Scudder reported thirty-one cases, all there were in the literature at that time. Two of these were under one year of age. Since that time, 163 cases have been reported, thirteen of which were less than one year old.

Torsion may occur at any age, most of the cases reported having been in young adults of twenty years of age. The youngest case on record is an infant at birth, reported by Taylor in *The British Medical Journal* in 1897. This child was operated upon two days later and the testicle found gangrenous. The cases reported here were eight, eight and ten months of age. The condition seems to be much more frequent in incompletely descended testes and somewhat more common on the right side. Two of my cases were on the right side, the testis being found in the inguinal canal in each. In two of them an indirect inguinal hernia was found, neither sac communicating with the tunica vaginalis.

The exact cause of torsion is unknown, but nearly every author has reported some abnormality in the attachment of the testis to the cord and epididymus. The most common findings are a capacious tunica vaginalis and either a long or broad mesorchium. A brief review of the embryology shows that the testicle and epididymus develop as separate structures, retroperitoneally, at the lower pole of the kidney, each with a separate mesentery attaching it to the posterior abdominal wall. The mesorchium is the original mesentery of the testicle and ceases to exist when the two mesenteries fuse as they normally do at about the fourth month of intra-uterine life. With an unobstructed passage the testis and epididymus reach the scrotum by the ninth month of fetal life. When there has been some interference with this fusion and passage to the scrotum, it is not uncommon to find a long mesorchium or a wide separation of testis and epididymus. Great variations in the attachment of the spermatic cord to the testis have been reported. These conditions, no doubt, predispose to torsion, and since abnormalities are more common in incompletely descended testes, it is probably for this reason that torsion is more often found where the testis has not reached the scrotum. In two of my cases, necrosis had reached a point that it was impossible to define the mesorchium, but each case showed a large tunica vaginalis.

It has been shown by experimental work that necrosis of the testis

develops if a complete torsion has existed for thirty hours. In my cases, the testes were found to be blue hæmorrhagic masses, the microscopic examination in each case showing advanced necrosis with almost complete loss of the structure of the testicle. The necrosis was less marked in the epididymus.

The most striking thing about these cases was the complete absence of symptoms in two of them. The other patient had been irritable with some vomiting and diarrhœa for three days. None of them looked sick; all were afebrile. All of them were brought to the hospital because the mothers had noticed a mass in the groin while bathing the babies.

Perhaps the most important points in the diagnosis of torsion are the presence of the inguinal mass and the absence of the testicle from the scrotum on the corresponding side. There may be a change in the color of the skin over the mass, but this was absent in two cases. Fluid may be present in the tunica vaginalis, and, if bloody, may help in the diagnosis. In none of these cases was the tunica vaginalis explored with a needle before operation as I consider the procedure too dangerous, particularly if the mass happens to be a strangulated hernia instead of torsion of the cord. In all of these cases the opposite testis was of normal size and in the scrotum.

The three conditions with which torsion is most apt to be confused are (1) Acute epididymo-orchitis. This condition is so rare in infancy that it is much safer in the presence of the signs to consider the case one of torsion. (2) Strangulated hernia. It is often impossible to differentiate between these two conditions. Since both require immediate operation, there is little point in spending time in an effort to make an exact diagnosis. (3) Acute inguinal adenitis. There will usually be some reason for the adenitis: either an infection of the leg, foot, or anal region, and a change in color of the skin over the mass.

No fatal case has been reported in the literature to date. Atrophy is sure to follow a complete torsion that has been present more than thirty hours. Sloughing and infection have been reported but are the exception rather than the rule. Infection is much more serious if there is an accompanying hernia sac through which the infection may reach the peritoneal cavity.

In complete torsion, if the circulation in the testis does not improve after detorsion and the application of hot pads, the testis and cord should be removed as the danger of infection in this badly damaged testis makes the chance too great to leave it. In incomplete torsion, simply straightening the cord out may suffice. In the above cases, there was no doubt at the time of operation what the best procedure was since necrosis to a rather marked degree had taken place in each case.

CASE I.—R. B. T., age ten months, was admitted to The Babies Hospital August 22, 1928, with a history of a swelling in the right groin for two days. Family history entirely negative. Patient was born three weeks prematurely but had shown normal development to date. Mother had noticed a swelling in the right groin two days before while bathing the baby. She had not noticed before that the right testis was not in the scrotum. She stated that the baby had shown no signs of pain nor discomfort either before or since she discovered the swelling. No history of trauma nor infection of

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foot, leg or anal region. Physical examination was entirely negative except for the local condition. There was a mass in the right inguinal region three and one-half by two and one-half centimetres, movable, not tender nor attached to the skin. No change in the color of the skin over it; no abdominal muscle spasm; no sign of infection of the neighboring parts. The right testicle was not in the scrotum, the left testis was of normal size in the scrotum. Rectal examination was negative. Urine, negative. Temperature 99; white blood cells 11,800; polynuclears 66; lymphocytes 34. *Diagnosis.*—*Torsion of the spermatic cord* or strangulated inguinal hernia of right side. Operation.—Right inguinal hernia incision exposed a gangrenous testicle in the inguinal canal with the cord twisted twice in a clockwise direction. Tunica vaginalis contained considerable bloody fluid and was about twice the normal size. Cord untwisted, but circulation failed to return so the cord and testis were removed after transfixing the cord at the internal ring. Microscopic examination (Fig. 1) showed complete destruction of the tubular structures in the testicle and to a lesser degree in the epididymus. Convalescence uneventful. Discharged on the eighth day with his wound healed by primary union. Follow-up: One and one-half years, general condition excellent; incision well healed: free from symptoms.

CASE II.—E. C., age eight months, was admitted to The Babies Hospital October 29, 1928. Complained of being irritable, having a swelling in the groin about four days. Child has been perfectly well to date and had had normal development. Four days previously the mother had first noticed a swelling in the right groin while bathing the baby. Child had done no vomiting and had apparently been in no pain during the four days. Physical examination was entirely negative except for the local condition. There was a mass in the right groin three by two centimetres, firm, fixed and somewhat tender. Skin over it was not changed in color. The right testicle was absent from the scrotum, the left testicle was normal in size and position. There was no infection of the leg nor anal region. Temperature, 100; pulse, 80; respiration, 22. Urine, negative. *Diagnosis.*—*Torsion of the right spermatic cord*. Operated upon immediately, the testicle being exposed in the inguinal canal through the usual hernia incision. The testicle was about twice the normal size, blue, hæmorrhagic, with the spermatic cord twisted upon itself one and one-half times in a clockwise direction. There was an indirect inguinal hernia sac found when the cord was untwisted, and it was treated in the usual way. As the color failed to return to the testicle after the application of hot moist pads, it was removed with the cord. Convalescence uneventful. Discharged on the eleventh day with the wound completely healed by primary union. Microscopic examination of the specimen removed showed almost complete destruction of structure of the testicle with necrosis less marked in the epididymus. Follow-up: One year, five months, free from symptoms. Incision soundly healed.

CASE III.—F. P., age eight months. Admitted to The Babies Hospital November 3, 1928, complaining of swelling in the left groin, vomiting and diarrhœa for three days. Three days before while bathing the baby the mother had first noticed a swelling in the left groin. Baby had been perfectly well previous to this time, but had diarrhœa and

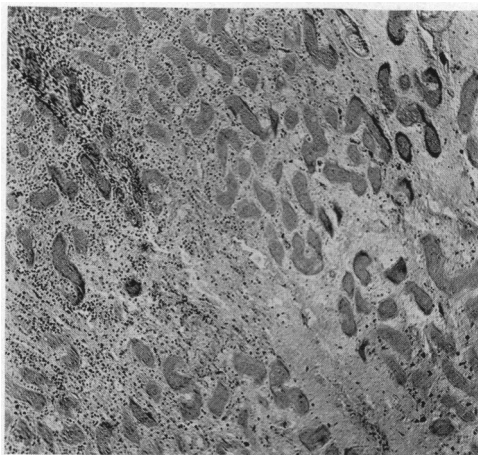


FIG. 1.—Microphotograph of testicle in Case I showing a large amount of hæmorrhage with almost complete destruction of the structure of the testicle.

vomited about three times daily for the following three days. Physical examination: Well-developed, well-nourished, white male infant, eight months of age, irritable, crying and apparently in pain. General examination was entirely negative except for the following: there was a mass in the left inguinal region four by three by two centimetres, firm, fixed and quite tender. Skin over it slightly red. Left testicle absent from the scrotum. Right testicle of normal size in the scrotum. *Diagnosis.*—*Torsion of the incompletely descended testis.* Immediate operation, the usual left hernia incision exposing a mass consisting of the left testicle, cord and hernia sac twisted on the cord

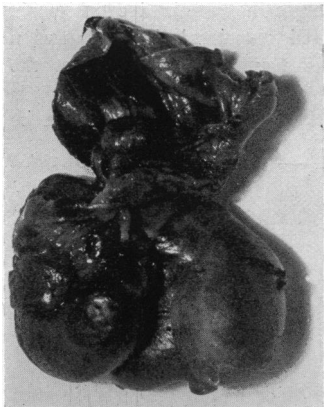


FIG. 2.—Photograph of the specimen in Case III immediately after operation, showing torsion of the cord just above the testicle and separation of the testicle and epididymus. The remnant of the accompanying hernia sac is seen at the upper part.

twice in a clockwise direction at the internal ring. Mass was hæmorrhagic, blue, rather densely adherent to the surrounding structures. (Fig. 2.) Upon release of the torsion and application of hot pads there was no change in the color of the testis. The hernia sac was treated in the usual way; the cord ligated at the internal ring and removed with the testicle. Incision closed with interrupted chromic. Convalescence was uneventful. Discharged on the seventh day with the wound soundly healed by primary union. Microscopic examination showed that there was complete loss of the structures of the testicle and epididymus. Follow-up: one year and five months later, incision well healed. Child entirely free from symptoms.

#### SUMMARY

1. Torsion of spermatic cord may occur at any age, but it is found most frequently in young adults.
2. It is most often found in incompletely descended testes.
3. Almost all cases show a long or broad mesorchium, a capacious tunica vaginalis or some abnormality in attachment of vas and epididymus to testis.
4. Atrophy of testis usually follows if torsion has been complete for thirty hours.
5. Sloughing and infection of testis may occur but not as frequently as atrophy.
6. Cases reported in infancy may lack the characteristic diagnostic signs found in adults.
7. Torsion must be differentiated from (1) acute epididymo-orchitis, (2) incarcerated inguinal hernia and (3) acute inguinal adenitis.
8. Orchidectomy should be done if circulation does not return after torsion has been corrected and heat applied.

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