HYDROCELE IN CHILDREN, WITH A REPORT OF CASES.¹

BY ROBERT W. LOVETT, M.D.

HYDROCELE in young children is an affection which differs in so many respects from the ordinary hydrocele of adults, that it seems to merit separate consideration, and especially since in the last few years new light has been thrown upon certain points in its etiology and clinical history.

In speaking of the affection, I have used the terms infantile and congenital hydrocele not in any technical sense, as is done by some writers, but as signifying only the hydrocele of young infants.

At birth the testis should have descended to the bottom of the scrotum, carrying with it a pouch of peritoneum, which is cut off from the abdominal cavity to form the tunica vaginalis. Between the abdominal rings and the tunica vaginalis there should be no passage, only the remains of the obliterated peritoneal pouch, which should exist as a fibrous cord.

A failure of all or part of this tract to close results in the escape of the abdominal fluid into the tunica vaginalis, which distends it and forms a hydrocele. That this failure to close is more common than had been supposed is demonstrated by the figures of Zuehlke,² who found that in 100 new-born children the neck of the peritoneal process had failed to close in 37, 20 of them being on both sides. The opening was often small and difficult to find, but it could be clearly demonstrated to exist.

There are five possibilities in the causation of infantile hydrocele, resulting from five different anatomical conditions, and resulting in as many different varieties of hydrocele, all of which are to be distinguished clinically.

(1) The entire process of peritoneum may remain widely open from the abdomen to the bottom of the scrotum. This is called by many writers *congenital hydrocele*. (2) The funicular process of peritoneum alone may remain open, forming a *funicular hydrocele*, which does not descend to the bottom of the scrotum. (3) The funicular process of the peritoneum may be shut off above and below, but distended with fluid, forming an *encysted hydrocele of the cord*. (4) *Infantile hydrocele* is the name applied by some English writers to the condition where the tunica vaginalis and funicular process are distended with fluid, but the internal ring is closed. (5) *Common vaginal or scrotal hydrocele* is the condition in which, as in adult hydrocele, the fluid accumulation is confined to the tunica vaginalis.

There are few figures bearing on the frequency of infantile hydrocele. In 247 new-born children, at the Dresden Clinic, Wechsleman³ found 37 cases of hydrocele. The proportion is surprisingly large, and not in accord with the statements of other writers. He explains it, however, on the ground that many of the hydroceles were so small that they would have escaped any but the closest observation.

The cases which I have the pleasure of presenting this evening are chiefly from the surgical clinic of the Children's Hospital; and, although they are not enough in number to serve as the basis of much generalization, they are nearly as large a group as any series

reported among young children, and they have been investigated largely as to the results of treatment. Of the 30 cases which I have been able to tabulate, all of which occurred previous to October 1889, five were cases of encysted hydrocele of the cord, and the remainder were situated in the tunica vaginalis, being examples of the ordinary infantile or scrotal hydrocele, with the exception of one case, which was a well-marked instance of funicular hydrocele, where the fluid did not reach the bottom of the scrotum.

The children were very young when they were seen. Two-thirds of them being in their first four months, five cases were in the second year, and over that age there were only three cases, all of which were five years old. These latter had been affected with hydrocele only a few weeks, so that they cannot be classed as congenital cases. Among Wechsleman's cases, where 247 children were observed twice a day during the first two weeks of life, it was found in the 37 cases where hydrocele occurred that it appeared from the second to the fourteenth day in a large proportion of all the cases; neither in the series of cases reported to-night were the congenital cases all noticed at birth. Fifteen of them were clearly described by the mothers as beginning then, but many of the others were described as beginning in the first few weeks of life. At the same time there were several cases where the hydrocele apparently began in the first few months, and in most of them no clearly marked traumatism could be assigned. Such cases were the three already alluded to, where the hydrocele began at the age of five; in the other instances, it began sometime in the first year.

It has ordinarily been stated that the hydrocele of infants is easily reducible, the fluid running back into the abdominal cavity when the child is laid on his back and the scrotum manipulated. In these 25 cases of vaginal hydrocele the notes were defective in three cases, and of the remaining 22 cases, 19 were not reducible by any ordinary manipulation. That is to say, no connection with the abdominal cavity could be demonstrated, as the children were examined in the Out-patient Department. There may have been a valve-like opening which permitted the fluid to flow into the scrotum, and not out of it; or, perhaps, prolonged recumbency would have obliterated the hydrocele, but to the ordinary tests the fluid was not reducible in 19 out of 22 cases of infantile hydrocele.

It was, therefore, a relief to find that Wechsleman⁴ found in 37 hydroceles of new-born children only 14 which were reducible, while 23 did not communicate, so far as could be ascertained, with the abdomen. Bryant,⁵ in 124 cases of children and adolescents, found only five which communicated; while Mechiour,⁶ in 282 similar cases, found only 21 which were reducible.

It is this class of cases of irreducible hydrocele which is of particular interest. When the funicular process of the peritoneum is open, it is easy to see the reason for the hydrocele. But when to all intents and purposes the funicular process is closed and the tunica vaginalis is a shut sac, it is more difficult to account for the presence of fluid in the scrotum.

It is evident that irreducible hydrocele may exist even in intrauterine life, as is shown by cases of

¹ Read at the Surgical Section of the Suffolk District Medical Society.

² Arch. f. Chir., xx, p. 216.

³ Arch. f. Klin. Chir., 1887, xxxvi, p. 627.

⁴ Arch. für Klin. Chir., 36, 1887, p. 631.

⁵ Guy's Hosp. Rep., 3 s., vol. II, p. 75.

⁶ Annali Universali di Medicina, 1886, April, May and June, p. 235.

Schreiger,⁷ Tavignot,⁸ von Ammon⁹ and particularly Legendre,¹⁰ who found in a child, which died almost immediately after birth a hydrocele the size of a hazel-nut where the peritoneal process was completely obliterated.

Taking then the existence of irreducible hydrocele in intrauterine life and in new-born children for an accepted fact, one is at a loss to account for it by the former theory that infantile hydrocele is due to a leaking of peritoneal fluid into the tunica vaginalis. It may be that the funicular process remains open unduly long and suddenly closes, leaving fluid in the tunica vaginalis. It may be that the accumulation of fluid results from traumatism at birth or afterward; or, finally, it may be due to an idiopathic, possibly an infectious inflammation of the tunica vaginalis. It has been demonstrated that obstruction to the circulation in the cord does not cause hydrocele.¹¹

The question of the causation of the affection must be left in this very unsatisfactory condition. Probably traumatism will in future be assigned a more prominent place among the causative factors.

Of course, it is not safe to assume in these cases that no connection with the abdomen exists, if one is contemplating the use of any irritating injection into the tunica vaginalis, but the matter is of interest from a diagnostic point of view.

Although the hydrocele of adults affects the right and left side in an equal proportion, when large numbers of cases are considered in children, the right side is much more frequently affected and double hydrocele is proportionally much more common. Of the 30 cases reported, nine were double, 12 affected the right side, six the left side, while in three the affection was unilateral but the side was not noted.

The coexistence of hernia was a point of decided interest. It would be supposed that patency of the inguinal canal which was sufficient to cause hydrocele would predispose to hernia, but curiously enough in these 30 cases, many of them being double and some extremely large, only three cases of coexisting hernia were noted, one a slight funicular hernia, and the other two well-marked cases of infantile hernia.

Cases of hernia with slight accompanying hydrocele have not been included in this report.

The size of these infantile hydroceles has varied very much, at times they have been small and flaccid, but more often tense and entirely filling the scrotum. It has not always been easy to say whether the accumulation was confined to the tunica vaginalis proper, or extended to the internal ring, nor is it a matter of very much importance. In the case of one child, two months old, with a double hydrocele, half an ounce of fluid was drawn from each side of the scrotum, and this, perhaps, was as severe a case as any coming under observation, although several were equally severe. This made a tumor the size of a small orange.

The diagnosis is, of course, simple, and is dwelt upon at some length in all the text-books. There is no impulse on crying except in cases where the canal is open, and in these the fluid is easily reduced without the characteristic gurgling of hernia. Where the inguinal canal is closed, it is easy to demonstrate the pyriform shape of the tumor and impulse is absent.

The swelling is, of course, translucent, but this is not an easy fact to ascertain in the case of small children. The coexistence of hernia often renders the diagnosis obscure. In encysted hydrocele of the cord a hard, elastic, and non-reducible swelling is felt in the inguinal canal, which varies from the size of the normal testicle to that of a cherry. It is most likely to be confused with a retained testis but the presence of both testes in the scrotum, of course disposes of that possibility and except for the very rare occurrence of tumors of the cord, such a swelling is not to be mistaken for anything else than an encysted hydrocele.

The prognosis is said to be much more favorable than in the hydrocele of adults. Certainly the results of treatment in these 30 cases would lead one to look for a speedily favorable result in cases which did not communicate with the abdomen. When, however, the tunica vaginalis is merely a prolongation of the peritoneal cavity, and the hydrocele is reducible, and especially if hernia coexists to continually distend the ring, the outlook is not so favorable as in those cases where the tunica vaginalis is shut off.

The treatment of the affection is, of course, the important practical interest in the discussion of these cases. I attempted to find out the results in these 30 cases, and by the kindness of my assistants at the hospital I have been able to learn the results in 21 cases. Many were from out-of-town and have neglected to answer letters, while others have disappeared from their former residences and were not to be traced by any amount of inquiry. All these cases were treated at the hospital previous to October, 1889, so that at least a full year has elapsed in every case.

Of the 30 cases it has been possible to obtain the results of treatment in 21.

Of the five cases of encysted hydrocele of the cord, four have been heard from and all were cured. One was tapped and cured by one withdrawal of the fluid. The other three were treated by counter irritation and expectancy, and yielded readily in a few days or weeks. None of these cases were congenital, and the affection had been of short duration in each case.

Of the 25 cases of scrotal hydrocele it is possible to report the results in 17 cases. Ten were tapped with a hypodermic needle or a small trocar, and the sac completely evacuated with every antiseptic precaution. Nine of these cases were cured, while one remains in the same condition at the end of two years. This was a case of double reducible hydrocele, widely open into the abdomen with a slight complicating hernia on one side. The child was tapped several times, and an attempt made to keep the fluid back by the use of a double worsted truss. No benefit whatever resulted from the treatment. The cases which were cured were tapped once or several times as occasion demanded and the sac in most cases refilled temporarily after tapping. Seven cases were treated without tapping, and the patients were kept merely under observation or given some mild counter-irritant to use. Four of these cases recovered, while three are not improved. Of these three cases that are not improved, two were reducible hydroceles, communicating freely with the abdomen (and in the case of the third no mention is made in the notes as to the patency of the abdominal ring.)

In these cases an attempt was also made to retain the fluid by the use of the worsted truss, but it was unsuccessful.

⁷ Von Walther and von Ammon's *Journal für Chir.*, xxxv, 121.

⁸ *Journal für Kinderkrankheiten*, Bd. i, p. 121.

⁹ *Angewandte Chir. Kinderkrankheiten*, p. 66.

¹⁰ *Journal für Kinderkrankheiten*, xxix, p. 235.

¹¹ *Langenbeck's Arch.*, xxiv, 1879, 399.

In so far as any conclusions may be drawn from so small a group of cases it seems safe to infer that hydroceles which do not communicate with the abdomen, that is, irreducible hydroceles, can be cured by simple tapping, and moreover, that there is a strong inherent tendency for them to recover under the simplest expectant treatment.

But if communication with the abdomen exists, the problem becomes more difficult and they do not seem to be amenable to this simple treatment or to expectant methods, and, finally, that encysted hydrocele of the cord has a strong inclination to recovery under the simplest methods. With regard, then, to simple irreducible hydrocele, which does not communicate with the abdomen, it seems unnecessary to go further in the discussion of the treatment. Many writers have advocated the injection of irritant fluids after the withdrawal of the contents of the sac, but that seems needless and risky. Cases of death have been reported following such injections and simple tapping seems to answer every purpose. At the French Society of Surgery the injection of chloride of ammonia was advocated by Gaillard, who reported successful cases from its use, and the injection of iodine, alcohol, chloride of zinc, and carbolic acid has been advocated by other writers. By such an authority as Koenig the use of irritant injections in infantile hydrocele is condemned under all circumstances.

The proceeding of puncturing the sac with a needle in several places to allow the fluid to escape into the subcutaneous tissue seems to present no advantage over the tapping of the sac and is more painful.

With regard to the treatment of reducible hydrocele the question is more difficult. Possibly in later years these cases reported as unimproved to-night, may have been cured by the growth of the children and the strengthening of their tissues.

A favorite mode of treatment for these, much advocated in the books, is the use of a spring truss which shall excite enough irritation around the inguinal canal to cause the closure of the sac, but certainly in the case mentioned above, the worsted truss accomplished nothing, and the use of a spring truss in a small child is associated with much discomfort and almost inevitably with excoriation of the skin which is constantly wet under the pad. The use of an irritant injection in these cases must certainly be attended with a great deal of risk, inasmuch as it causes inflammation of a portion of the peritoneal cavity which may become general.

With regard to the operative treatment of these cases the writer has had no experience whatever. French surgeons who have been the most active in the discussion of infantile hydrocele, unite in deprecating early operation. Gaillard would never operate before the age of five or six, while St. Germain advises operation at the age of three, when the tumor is as large as a hen's egg. In general, however, the question of operation is deferred still longer.

The operative treatment consists in passing a subcutaneous ligature around the neck of the sac to obliterate the connection with the abdomen, or the sac is laid open and after the closure of the funicular process, allowed to granulate up as in the operation for adult hydrocele.

In conclusion, if these cases have served to show anything it has been to demonstrate that all cases of infantile hydrocele are not present at birth, but begin

later in many instances. That the majority of cases of infantile hydrocele cannot be demonstrated to communicate with the abdominal cavity, and that, finally, with a strong intrinsic tendency toward recovery, the disappearance of the affection is much hastened by the antiseptic withdrawal of the fluid contents of the tunica vaginalis where communication with the abdomen cannot be demonstrated.

BIBLIOGRAPHY.

- Poland. *Lancet*, 1884, II, p. 1001. (Fatal case.)
 Faure. *Gazette des Hôp.*, 1889, p. 845.
 Letulle. *Bull. de la Soc. Anat.*, 1875, p. 109. (Autopsies.)
 Berry. *Lancet*, 1883, I, p. 863. (Autopsies.)
 Monod and Terillon. *Mal du Testicule et de ses Annexes.* Paris, 1889. (Path.)
 Southam. *British Medical Journal*, 1884, p. 161. (Lig. of sac.)
 Arnison. *British Medical Journal*, 1885, II, p. 397.
 Osborn. *Lancet*, 1880, 285. (Acupuncture.)

CONGENITAL DEFORMITY OF THE NOSE.

BY E. H. BRADFORD, M.D.

THE following case is unusual, and as such deserves to be recorded. It is one of a congenital defect in the shape of the nose, consisting of a depression in the median line of the nose, a broadening at its base, and a superabundance of skin, which gave a peculiarly disagreeable appearance to the face.

An examination by Dr. Langmaid and Dr. Leland of the internal condition of the nose failed to discover any abnormality. The child had been perfectly healthy, and there was no history of catarrh or any trouble of the nose during infancy or at birth. The deformity, apparently, was due entirely to a congenital malformation of the bones, the cartilage, and the skin.

There is no history of deformity of the sort among the parents or relatives of the child, and there is no cause known for this occurrence at the birth of the child, which was perfectly normal.

On palpation there seemed to be an unusual amount of loose skin over the nose. The color of the skin was normal, except that in the median line, and a little to the left, in the depression, the skin was whiter than elsewhere, looking the color of cicatricial tissue, though there was no other evidence of a cicatrix. The nostrils were wide, and the tip of the nose was slightly raised. The nasal bones seemed normal in length, but were abnormally widened. On feeling the cartilage over the bridge of the nose, in one spot the cartilage seemed softer than normal, as if there was a hole in the cartilage. The cartilage was, perhaps, thinner at this spot than is normal. This place was from an eighth to a quarter of an inch in diameter. In other respects the nose was normal, except in shape. It seemed to have a concavity in the median line, and about the middle of the nose, seen on profile. The alæ of the nostrils spread more than is normal. The nose, however, was firm in resistance to any lateral pressure, and the septum of the nose seemed to be normal.

The eyes seemed wider apart than is usual, and the eye-brows had a slope to the inner side, characteristic of the Chinese.

The child was in perfectly good health, was three years old, and had no trouble in breathing through the nostril; and, in fact, appeared to be in no way incommoded by this deformity.

¹ Read at the Meeting of the Surgical Section of the Suffolk District Medical Society, November 5, 1890.