TORSED INTRAABDOMINAL TESTICULAR TUMOR DIAGNOSED DURING SURGERY PERFORMED DUE TO SUSPICION OF ACUTE APPENDICITIS

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Intra-abdominal neoplasmatic testicular torsion is a very rare clinical condition, which is normally not considered during differential diagnosis of acute appendicitis. The above-mentioned is most often observed in patients after puberty, without any previous specific symptoms apart from the absence of the testis in the scrotum and inguinal canal or periodic pain in the right lower abdomen. The study presented a case of a 22-year old male patient who was admitted and operated with suspicion of acute appendicitis. During surgery we observed intra-abdominal testicular torsion, both the testis and appendix were excised. Postoperative histopathological results were as follows: seminoma of the testis and normal appendix. The study presented available data concerning the above-mentioned rare clinical condition, as well as principles of diagnosis and treatment.

Key words: intra-abdominal testis, seminoma, torsion, cryptorchidism, acute appendicitis

Cryptorchidism is a condition which is observed relatively frequently in pediatric urology, as it concerns 3% of infants born at term, and 30% of premature infants. During the first year of life a greater percentage of testes (75 and 90%, respectively) descend spontaneously, which results in the limitation of cryptorchidism occurrence to 0.8-1% of the population. Cryptorchidism concerns both testes in 10% of cases of which 3% lack one or both testes. In 14% of cases the above-mentioned is observed in the family (1, 2). The etiology of cryptorchidism is associated with three groups: 1) endocrine – reduced fetal Leydig cell response to the gonadotropin of the mother and fetus; other include chromosomal disturbances, such as Klinefelter’s syndrome (47,XXY), „male XX karyotype”, or congenital testosteron production disturbances; 2) primary testicular disorders (fetal dysgenesis), congenital spermatogenesis disturbances; 3) mechanical factors, such as short spermatic cord, narrow inguinal canal, peritoneal adhesions, mesenteric disorders, open vaginal process of the peritoneum, poor development of the gubernaculum of the testis or mid-scrotum (3).

Cryptorchidism with intra-abdominal testis localization is rarely diagnosed and concerns 10% of the general population of patients (2). Its characteristic feature is the absence of the testis in the scrotum and inguinal canal, and lack of specific symptoms or unspecific clinical symptoms related to the mass effect, such as periodic hypogastric pain, pollakiuria, and dysuria (4).

The intra-abdominal location of the testis is often associated with testicular neoplastic disease. The risk of cancer development in case of cryptorchidism is 20 to 40-fold greater, as compared to the testicle located in the scrotum. Ventral detention of the testis is associated with a four times greater probability of cancer devel-
Torsed testicular tumor diagnosed during appendectomy

opment, as compared to the testicle detained in the inguinal canal. In case of undescended testes one may diagnose 10% of testicular cancer, of which 60% are seminomas (1, 2). Farrer et al. estimated the incidence of germinal cancer in patients with cryptorchidism at 1:2550 (1), as compared to the incidence in the general population: 1:100 000 (1, 5). Testicular tumors located in the abdomen can grow to relatively large sizes, which correlates with the increased likelihood of nodal metastases (4).

Testicular torsion may occur at any age but is most common during adolescence (between 12 and 18 years), its incidence gradually decreasing (Scorer and Farrington – 1971) (7). The occurrence of testicular torsion is estimated at 1 in 4000 adult patients under the age of 25 years (1, 2).

Undescended testes exhibit high mobility, thus, 25-60% of testicular torsion cases are diagnosed in undescended cases (8). The incidence of testicular torsion in the inguinal canal ranges between 9 and 45% (3). Data concerning intra-abdominal testicular torsion remains unknown, but in patients with the above-mentioned anomaly, 65% are diagnosed with neoplastic disease (the study group comprised 34 patients of which 22 were diagnosed with malignant cancer of the testis) (1, 9).

Torsion of an intra-abdominal undescended malignant testis is a clinical condition leading towards development of acute abdominal symptoms. Proper preoperative diagnosis is difficult if the intra-abdominal location of the testis is not visualized on the basis of preoperative imaging examinations (1, 10, 11).

CASE REPORT

Emergency service was summoned to a 22 year-old male patient with mental retardation, residing in a nursing home, due to several hours of abdominal pain. The patient was admitted to the Department of Surgery, Municipal Hospital in Tchew with suspicion of acute appendicitis.

On admission, the patient complained of right hypogastric pain. The clinical examination revealed right hypogastric pain with a positive peritoneal sign and absence of the right testis in the scrotum and inguinal canal. Laboratory results were as follows: WBC-11,6 G/l, Hb-14,8 g/dl, Ht-42,2%, RBC-4,79 T/l, CRP-52,86 mg/l. The urine sample showed no significant abnormalities. Abdominal ultrasound was not performed, due to lack of equipment. On the basis of clinical symptoms the patient was admitted to the Department of Surgery with suspicion of acute appendicitis. Surgery was performed by means of the transverse incision. The appendix proved unchanged with an insignificant amount of serous fluid. Surgery was extended to an explorative laparotomy of the abdominal cavity. A cylindric tumor, 6x3x9 cm in size was observed in the rectourinary pouch, connected by means of a long, torsed pedicle with the area of the internal opening of the right inguinal canal. After preparation of the tumor above the abdominal integuments we observed that the pedicle of the lesion was the torsed spermatic cord, and that the tumor proved to be an inflamed right testis with symptoms of ischemia. Due to the visible changes the testis and spermatic cord were excised. The spermatic cord was severed at its base, near the internal ring of the inguinal canal. Appendectomy was performed in a typical manner. The abdominal cavity was closed by means of interrupted sutures. The postoperative period proved uneventful. The patient was discharged from the hospital five days after surgery.

The histopathological examination result was as follows: the testis was 6x3x9 cm in size, excised together with the epididymis and sper-
matic cord (5 cm). On cross-section of the testis we revealed the presence of a compact tumor, 3.5x3x4 cm in size, with cherry-like foci of necrotizing tissue. The tumor infiltrated the testicular tunica without penetrating into the epididymis. The above-mentioned presented with features of swelling. The spermatic cord was without focal lesions.

Histopathological diagnosis:
1) seminoma testis,
2) normal structure of the appendix.

**DISCUSSION**

Torsed intra-abdominal testicular tumor is a very rare clinical condition. The incidence of the above-mentioned condition is so small that even though intra-abdominal testicular torsion may cause symptoms of acute abdomen (L), and if torsion is located on the right side mimicking symptoms of acute appendicitis, none of the basic Polish textbooks mention the above-mentioned in the differential diagnosis of appendicitis (12, 13, 14).

Cryptorchidism is a developmental disorder of the male reproductive system consisting in the lack of testicular descent into the scrotum. The above-mentioned defect is observed in 1-4% of infants born at term. Due to spontaneous testicular descent after birth the rate of cryptorchidism at the age of one year is reduced to 0.8% (1). Until the third month of life spontaneous testis descent is observed in 70% of cases (6).

Intraabdominal undescended testes are observed in 10% of cases (2). Cryptorchidism promotes neoplastic transformation, thus, the relative risk of developing cancer in an undescended testis is 5-15 times greater, as compared to a normally descended testis (15). Intraabdominal cryptorchidism increases the risk of neoplastic development four-fold, as compared to inguinal cryptorchidism (9). Approximately 10% of testicular tumors develop from undescended testes (1), and the risk of neoplastic transformation in case of intrabdominal location amounts to 4-5%, and increases with age (11, 16). 50% of patients with a testicular tumor mention the presence of an undescended testis (2).

The few studies concerning the intraperitoneal location of the testis demonstrated that intraabdominal testicular torsion is more common than the torsion of a normally descended testis (1, 2, 16). In 1996, Hutcheson et al. analysed a group of 37 patients subject to excision of the torsed, neoplastic changed intraperitoneal testis. Bilateral cryptorchidism was diagnosed in 1/3 of patients. 65% of the removed testes were diagnosed with neoplastic infiltration. The most common histological type was seminoma (in 19 of 36 patients), followed by teratoma, embryonal carcinoma, and choriocarcinoma. Teratoma was diagnosed in all operated patients, which reflects the higher incidence of the above-mentioned in this age group. Testicular torsion was more often observed on the right side, as compared to left-sided torsion (20/13). In 4 patients we were unable to locate the side of torsion. Patient age ranged between 3 months and 49 years, with 1/3 of patients exceeding the age of 31 years (9).

Although intraabdominal testicular torsion may occur, both in infants and small children, most cases develop after puberty (1, 2). Key et al. described a patient with intraabdominal testicular torsion, additionally diagnosed with an intraabdominal testis on the opposite side, with both testes of sarcoma structure (17). Radford et al. described a case of an undescended testis, which caused symptoms identical with acute appendicitis, and concluded that the presence of an intraperitoneal testis might lead towards life-threatening complications (torsion, necrosis or bleeding) (18). Other Authors also confirmed the presence of the above-mentioned complications (9). Although it is possible to observe intraabdominal testicular torsion in an atrophic testis (19), torsion is more commonly observed in the presence of testicular tumor (1, 9). Most of the described tumors are large in size, which is justified by the development of the tumor in the intraabdominal location. Miller et al. described patients with an average tumor size of 10 cm (ranging between 7-11 cm) (20). The largest tumor was 16x15x9 cm in size, according to Hutcheson et al. It is suggested that the increased probability of torsion is associated with greater testicular volume, which is observed during maturation, as well as increased testicular volume, due to tumor growth (9).

The typical symptom responsible for the arrival at the ER is sudden pain, located in the lower quadrants of the abdominal cavity. Nausea and vomiting are present in approximate-
ly 50% of patients, often accompanied by slight fever. A palpable tumor is rarely described, although Hutcheson et al. mentioned its presence in 19 of 36 patients (abdominal cavity palpation and per rectum examination). Abdominal pain was present in all patients except one. Some of the patients experienced pain radiating to the thigh or scrotum. In many cases, similar complaints occurred during the past months. The above-mentioned course of the disease might correspond to the torsion-detorsion syndrome (9).

Intraabdominal testicular torsion is not responsible for specific abnormalities observed in standard tests performed during diagnostics of acute hypogastric abdominal pain. Leucocytosis remains within normal limits, although may be elevated. Hutcheson et al. mentioned data concerning imaging examinations. Radiological changes were observed in 8 of the 36 study group patients. The abdominal X-ray was normal or showed signs of small bowel occlusion. Two of the patients presented with suspicion of a tumor, but only one was identified retrospectively. In one of the patients computer tomography revealed the presence of a tumor, being performed after the abdominal symptoms had subsided and after hospitalization. Delayed surgery revealed the presence of a torse, testicular tumor. Arteriography which was performed in one patient enabled to detect the testicular tumor, as well as its preoperative torsion (9). The increasing availability of computer tomography in most centers increased the probability of a proper initial diagnosis, if the clinical examination result and patient symptoms were associated with the presence of cryptorchism.

Achieving proper initial diagnosis is difficult and results from the similarity of intraabdominal testicular torsion symptoms with acute appendicitis symptoms. Differential diagnosis includes acute appendicitis, colon diverticulitis, intraperitoneal epididymitis, peptic ulcer perforation, as well as inflammatory, traumatic and iatrogenic perforation of the gastrointestinal tract. Many authors reported that improper diagnosis was partly due to erroneous information obtained from the patient, since some patients reported false data (as it later turned out) concerning previous surgical removal of the testis (9). The undescended testis may be subject to torsion in the inguinal canal, but is easily accessible to palpation. Thus, proper diagnosis is possible. If intraabdominal testicular torsion is observed the physical examination, as the only diagnostic examination seems insufficient for proper diagnosis.

Intraabdominal testicular torsion is more often observed on the right side (approximately 56%) (9), contrary to the situation observed in case of a normal testis where, due to a longer spermatic cord on the left side torsion is left-sided (approximately 62%), with disease incidence at 1:160 (3). Right-sided testicular torsion might pose diagnostic doubts during differential diagnosis of acute appendicitis. Proper diagnosis in patients lacking testes in the scrotum and inguinal canal requires, apart from thorough examination of the abdominal cavity and genitourinary organs, the consideration of the possibility of such a diagnosis.

Many studies have sought to determine the exact method of diagnosis acute appendicitis. One of these methods is the Alvarado scoring system (21). In case of intraabdominal testicular torsion the Alvarado scoring system might be similar to that observed in case of acute appendicitis. In centers where emergency abdominal ultrasound, computer tomography, and magnetic imaging examinations are possible, the above-mentioned performed before surgery might allow to establish proper diagnosis. Although the ability to identify the testicle by means of these examinations is unsatisfactory and remains at 32-67% (1, 10, 11).

Laparotomy or laparoscopy, due to appendicitis symptoms, and the intraoperative visualization of a normal appendix might lead towards the search for a different pathology, responsible for acute abdomen, including intraabdominal testicular torsion. The recommended therapeutic process in case of diagnosed intraabdominal testicular torsion in male patients is orchiectomy, because on one hand, in most cases the intraabdominal testes lost their reproductive function (22, 23). On the other hand, there is increased risk of neoplastic presence in such a testis (1, 2, 16). In children and adult patients who, due to psychological or cosmetic reasons do not accept the excision of the testis, orchiopexy should be performed, followed by oncological supervision (9).

In conclusion, although most authors of general surgery textbooks mention testicular torsion in the scrotum, as a potential cause of pain radiating to the right iliac fossa, at the
same time the majority of surgical textbooks do not mention testicular torsion as a disease entity, which should be considered during differential diagnosis of acute appendicitis. Clinical physicians should be aware of the fact that intraperitoneal testicular torsion can mimic acute appendicitis. If the right side of the scrotum does not contain the testis, one should consider the possibility of intraabdominal testicular torsion. For these reasons the presentation of the above-mentioned case seems important and interesting.

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