Spontaneous rupture of the urinary bladder — delayed sequel of pelvic irradiation

A case report

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Summary

A case of spontaneous perforation in an irradiated urinary bladder is presented. Aspects of aetiology, clinical presentation, diagnosis and management are briefly discussed.

The commonest cause of rupture of the bladder is blunt, penetrating or surgical trauma. Spontaneous or idiopathic rupture of the bladder is rare with only 140 cases having been reported in the English-language literature to date. Nearly always, there are underlying bladder lesions either inflammatory, malignant or obstructive which weaken the bladder wall and precipitate the perforation.

In the English-language literature, the only case of spontaneous bladder perforation associated with pelvic irradiation was reported by Altman and Horsburgh in 1966. However the patient had a bladder wall of normal thickness as well as heavily infected urine and no other stigmata of irradiation damage, so the association must be questioned.

A case of spontaneous bladder perforation in a patient who had had a pelvic irradiation 16 years previously and who had classic features of irradiation damage to the bladder is reported.

Case report

A 65-year-old woman presented in April 1985 with an acute abdomen. In 1968 she had undergone a Wertheim hysterectomy followed by pelvic irradiation for carcinoma of the cervix uteri. In 1983 she had had a laparotomy for intestinal obstruction due to dense pelvic adhesions. On the third postoperative day she developed a urinary fistula from the bladder, which closed spontaneously after prolonged catheter drainage.

On this admission the patient gave a history of progressive lower abdominal pain, nausea, difficulty in micturition and oliguria. There was no history of recent trauma. Examination showed a distressed but haemodynamically stable patient. The abdomen was distended and bowel sounds were diminished. There was marked tenderness, guarding and rebound tenderness over the lower abdomen. Radiographs suggested the presence of free intra-abdominal fluid. A few small bowel air fluid levels were present.

Blood urea level was slightly elevated (8.6 mmol/l), creatinine level normal. The white cell count was 1.7 x 10^9/l. A Foley catheter was inserted via the urethra into the bladder and 1500 ml of clear fluid drained immediately.

A provisional diagnosis of acute peritonitis was made. At laparotomy, 3 litres of free intraperitoneal fluid were drained. After mobilization of the bowel, the tip of the Foley catheter was found in the peritoneal cavity. There was a perforation in the dome of the bladder, through which the catheter had passed. The bladder wall was paper thin, the mucosa was pale and friable and telangiectatic vessels were visible on its surface. The size of the bladder was markedly diminished.

The bladder was repaired in two layers with absorbable suture material, and the repair reinforced with adjacent adherent small bowel. A suprapubic as well as a urethral catheter was inserted. The extraperitoneal space was drained.

Postoperatively the patient recovered well. Cystography on day 10 showed a capacity of 300 ml with no leak. The catheter was removed and when the patient was discharged she was voiding every 3-4 hours.

Discussion

Review of the English-language literature as well as experience of this case demonstrates that spontaneous bladder perforation is often unrecognized pre-operatively. However, the sequence of oliguria and anuria, resulting from extravasation of urine into the peritoneal cavity, and its temporal relationship to the onset of abdominal distension and pain as chemical peritonitis develops, should raise the suspicion of bladder perforation and prompt the carrying out of a cystogram, especially if there are underlying lower urinary tract lesions. Recent trauma to the pelvis should be excluded and, as noted by Turnbull et al., delayed rupture of the bladder may occur as late as 4 weeks after pelvic injury. The likely mechanism is an initial severe contusion to the bladder; this in conjunction with pressure from a pelvic haematoma leads to secondary sloughing of the injured bladder with delayed rupture.

Shah et al. in a clinical and experimental study showed that the serum urea level rises significantly within 1 hour of intraperitoneal rupture of the bladder. Serum creatinine levels remain normal or rise much later than urea levels. Thus, an elevated serum urea level or urea/creatinine ratio is a sensitive biochemical parameter in the detection of intraperitoneal rupture of the bladder.

Our patient had only minimal elevation of the serum urea level, possibly related to the irradiation fibrosis and adhesions of the lower abdominal peritoneum which could prevent urea absorption across the peritoneal membrane into the intravascular compartment.

Wheeler reported a case of recurrent spontaneous rupture of the bladder, and found only 5 similar cases in the literature, none of them subsequent to irradiation injury. Our patient developed a urinary fistula from her bladder a few days after a
previous laparotomy for intestinal obstruction. This fistula could represent a spontaneous perforation which decompressed through a fresh abdominal wound. Thus, this is the first reported case of recurrent spontaneous rupture of the bladder after deep radiotherapy to the pelvis.

Treatment consists of surgical exploration after adequate resuscitation and under antibiotic cover. The peritoneal cavity should be thoroughly lavaged, the perforation closed in layers with absorbable suture material. The bladder should be adequately decompressed for 10-14 days with suprapubic and urethral catheters, and a drain must be left in the extraperitoneal space. Healing should be confirmed by a cystogram before the catheters are removed.

The mortality rate for spontaneous perforation of the bladder is as high as 25%. Chronic underlying diseases are the major determinants of outcome, but early recognition of this condition and aggressive surgical treatment are the most effective steps in saving these patients.

REFERENCES

News and Comment/Nuus en Kommentaar

Rural dangers

It is an extraordinary fact that while much is made of industrial safety very little is reported about agricultural hazards. Yet the countryside has been shown many times to be a somewhat dangerous area to work in. In 1981 the National Safety Council in the USA pointed out that the death rate for agricultural workers was 61/100 000 compared with only 13/100 000 for workers overall. Since then similar reports from Norway and Sweden have once more indicated the dangers of rural life. The latest report comes from Denmark (Nielsen and Nielsen, Ugeskr Laeger 1986; 148: 1705). These authors made a prospective investigation in 1984 of all agricultural accidents treated at a hospital in Denmark serving an agricultural region with 4 500 farms. One striking feature, which has been remarked upon elsewhere, was that out of the 142 patients involved 22% were children under the age of 14 years. In the majority of these accidents, machinery was involved and almost 50% of the machinery accidents were due simply to carelessness. The majority of the accidents happened to males, and injuries mostly involved limbs. It is a reflection of the increasing mechanization of farming that only 21% of all accidents were caused by animals. It would be interesting to conduct a similar study on an agricultural community in the RSA.

Acute epiglottitis in adults

Acute epiglottitis is a serious disease because it may lead to sudden airway obstruction in previously healthy people. Many people think of it as a childhood disorder exclusively, but in recent years a number of cases have been reported among adults. Mayo-Smith et al. (N Engl J Med 1986; 314: 1133) report on a retrospective study of all cases of acute epiglottitis in adults seen in the hospitals of Rhode Island and the State Medical Examiner's Office over an 8-year period. They found 56 cases, with a significant increase in the last 2 study years. The average age of the patients was 44 years and the sexes were about evenly distributed, as was the seasonal incidence. Practically all the patients complained of sore throat or dysphagia and about half of them had respiratory difficulty. Four patients died, all from acute airway obstruction; 2 died after admission while being observed without an airway. The most common pathogen recovered was Haemophilus influenzae.

The authors note that no airway obstruction was precipitated by laryngoscopy, but advise early airway protection by endotracheal intubation, together with appropriate antibiotic therapy.

The problem of neonatal conjunctivitis

When Credé introduced the use of silver nitrate drops in 1884 for the prophylaxis of neonatal ophthalmia, the technique enjoyed considerable success since most conjunctivitis in the newborn in those days was due to gonococci. However, times have changed, although Credé's prophylaxis is still used in some parts of the world, and the micro-organisms responsible for neonatal conjunctivitis have changed with them. Although gonorrhoea is still with us, a large proportion of cases of neonatal conjunctivitis are now due either to bacteria such as staphylococci or streptococci or to Chlamydia trachomatis, which is not affected by silver nitrate. Americans have recorded that up to 73% of cases are due to Chlamydia.

Two recent articles in JAMA (Rapozza et al., JAMA 1986, 255; 3369 and Schachter et al., JAMA 1986; 255: 3374) remind us that all is not well either with the diagnosis or the treatment of these cases. The first study revealed that chlamydial infection was diagnosed by the technique of staining conjunctival smears by a direct immunofluorescent monoclonal antibody method in no less than 46 of 100 consecutive neonates with conjunctivitis. The remaining 54 infants had a bacterial infection most commonly caused by staphylococci, streptococci or Haemophilus. The authors conclude from their studies that chlamydial infection can be diagnosed effectively and rapidly by this technique, but they are disturbed by the 19% treatment failure rate in these cases. These patients had been given the usual course of oral erythromycin 50 mg/kg/d in 4 divided doses for 2 weeks. Infants with persistent chlamydial conjunctivitis were given a second 2-week course of oral erythromycin. If infection still persisted they were given co-trimoxazole suspension together with topical tetracycline.

The second article deals with a 5-year prospective study at San Francisco General Hospital carried out to assess the risk of chlamydial infection in the perinatal population at large. They found that 4.7% of expectant mothers had positive chlamydial cultures. Of the newborn infants 2.8% showed serological evidence of perinatal clinical infection and 1.4% developed either chlamydial pneumonia or conjunctivitis. The authors therefore make a plea for treatment of culture-positive pregnant women and their sexual partners with a 1- or 2-week course of erythromycin during the 36th week of pregnancy. In a high-prevalence setting, this can be a cost-effective strategy. They believe that some time in the future the screening and treatment of pregnant women for chlamydial infections will become as routine as that for syphilis and gonorrhoea.