spinal cord, together with absence of skin, made any plastic repair with reconstruction of the urethra at this region impossible, in contrast to the management of urethral fistula located at the penoscrotal junction.[1] The health of the patient improved greatly, since the buttocks became covered with skin for the first time in 31 years; the uroseptic symptoms of chills and fever subsided completely as the suprapubic cystostomy began to function well. With continuing good care the patient has a good life expectancy.

SUMMARY

The case is reported of a 55-year-old veteran of World War I in whom a clinically complete cord lesion developed at the level of D4 after repeated bouts of tonsillitis. Decubitus ulcers occurred on both ischial regions, joined by extension to the perineum, and caused a perineal urethral fistula. After diversional suprapubic cystostomy, operative closure in two stages succeeded although the ulcer had persisted over a period of 31 years and despite extensive bone erosion which led to what amounted to spontaneous amputation of the ischial tuberosities.

REFERENCES

1. Comarr, A. E., and Bors, E.: Pathological changes in the urethra of paraplegic patients, J. Urol., 66:355-361, Sept. 1951.

2. Comarr. A. E.: Management of paraplegic decubitus ulcers, Ann. West. Med. & Surg., 3:235-240, July 1949.

3. Thompson, C. E., and Rice, M. L., Jr.: Secondary amyloidosis in spinal cord injury, Ann. Int. Med., 31:1057-1065, Dec. 1949.

Mucocele of the Appendix Complicated by Torsion and Gangrene

D. R. DICKSON, *M.D.*, and
W. KENNETH JENNINGS, *M.D.*, Santa Barbara

MUCOCELE OF THE APPENDIX is an unusual condition and the complication of torsion and gangrene, as in the case herein, has been reported only twice previously.[6,7]

From a review of reports in the literature on large series it appears that mucocele is present in about 0.2 per cent of cases in which the appendix is removed; that the incidence is slightly greater in females than males; and that the condition occurs most often in the fourth, fifth and sixth decades of life, although instances have been reported between the ages of 4 and 70.

Results of studies of rabbits by Grodinsky and Rubnitz[5] and Cheng[4] indicated that the pathogenic sequence in the development of mucocele is: obliteration of the appendicial lumen in the absence of suppuration; active secretion of the mucosa; gradual distention of the appendix. In man, inflammation is the most definite and common factor causing mucocele. It is noteworthy that in many reported cases mention is made of a history suggestive of appendicitis which subsided spontaneously. Other reported causes of mucocele are carcinoid tumor of the appendix, appendicial abscess, and adenocarcinoma, endometrioma and tuberculosis of the cecum. The association of mucocele of the appendix and pseudomyxoma peritonei resulting from rupture of an ovarian cystadenoma has been frequently observed, but the relationship is not clear.[3] Rosenfeld[9] stated that mucocele of the appendix occurs in 25 per cent of such cases.

Mucoceles vary in size from slightly larger than a normal appendix to as much as 30 cm. in length. With gradual progressive distention the muscularis undergoes attenuation and fibrous tissue replacement. The wall in larger specimens in which mucocele has been present a long time may consist of only thin bands of hyalinized fibrous connective tissue with extensive areas devoid of mucosa. In the early stages the mucous content of a mucocele is clear and viscid; later it becomes gelatinous and turbid. The presence of small globular bodies of inspissated mucoid material in the dilated lumen has been referred to as "myxoglobulosis."

The most common complication of mucocele—rupture and the extrusion of the contents into the peritoneal cavity—may initiate pseudomyxoma peritonei. Rubnitz and Herman,[10] Cheng[4] and Bergan[1] have presented experimental evidence strongly supporting the postulation that pseudomyxoma peritonei of appendicial origin is a type of foreign body peritonitis resulting from mechanical or chemical irritation. Other complications include intussusception, acute inflammation and inclusion in hernial sacs. In one of several cases of calcified mucocele reported upon by Ostrum and Miller,[8] multiple fistulas developed following rupture of the tumor.

Often a mucocele is entirely asymptomatic and is noted only fortuitously in the course of abdominal or pelvic surgical procedures. When there are symptoms they are more often than not poorly defined—vague abdominal pain or tenderness in the right lower quadrant of the abdomen, sometimes associated with nausea or other manifestations of digestive disturbance. Acute symptoms occur with the various complications and depend on the complication. However, in several reported instances the first evidence of pseudomyxoma peritonei was the unexpected finding of mucinous material in a hernial sac during herniorrhaphy.[3] The difficulty in clinical diagnosis because of the lack of pathognomonic signs and symptoms is attested by the rarity of correct preoperative diagnoses. The only reported correct preoperative diagnoses have been accomplished by the demonstration of a mucocele during roentgen studies with barium enema.[2] Palpable mucoceles have been considered preoperatively as renal, retroperitoneal, cecal, uterine or ovarian masses. In the majority of reported cases in which symptoms were present the preoperative diagnosis was chronic appendicitis.

The treatment is surgical. If rupture has occurred just before operation or occurs during removal of the tumor, the patient can be expected to recover if all the extruded material is carefully removed. If there has been a large volume of mucocele content in the peritoneal cavity for a long time, the prognosis is grave.

REPORT OF A CASE

A 60-year-old Caucasian woman entered the hospital with chief complaint of pain in the lower abdomen, most severe in the right iliac area. At the onset, three days earlier, the pain had been generalized in the abdomen but in the previous 24 hours it had localized. The patient was nauseated and had vomited several times the first day. There was no antecedent history suggestive of appendicitis.

The patient was well developed and well nourished and did not appear to be acutely ill. The systolic blood pressure was 120 mm. of mercury and the diastolic pressure 78 mm. The pulse rate was 90. The temperature was 98.4° F. Tender to palpation throughout, the abdomen was exquisitely tender in the right iliac area and there was involuntary guarding over both lower abdominal quadrants. The uterus was small and mobile and the adnexa normal. Pain in the right adnexal area occurred upon manipulation of the

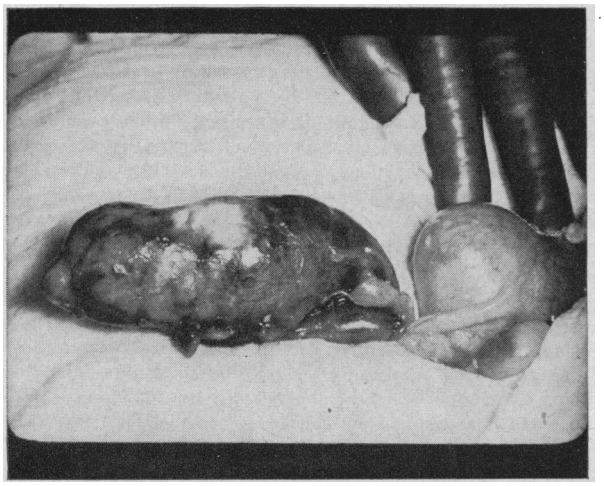

Figure 1.—Gangrenous mucocele of the appendix with the cecum delivered through the abdominal incision. Note the torsion of the undilated appendicial base.

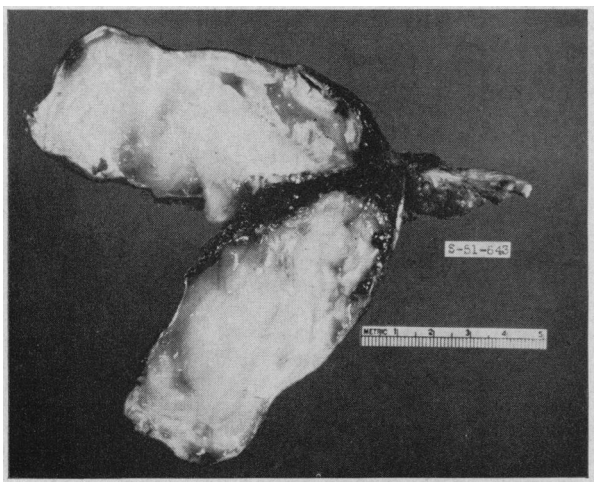

Figure 2.—Longitudinal section of the surgical specimen, showing the contents of the mucocele.

cervix. Leukocytes numbered 15,000 per cu. mm. of blood. Results of urinalysis were within normal limits. A diagnosis of acute appendicitis was made and operation was begun three hours after admittance to the hospital.

The peritoneal cavity, entered through a low paramedian abdominal incision, contained a moderate amount of serosanguineous fluid. A deeply cyanotic sausage-shaped tumefaction of the appendix was delivered into the operative field. The tumor had undergone torsion, consisting of two complete rotations, at the junction of the undilated proximal quarter of the appendix and the dilated distal three-quarters (Figure 1). Appendectomy was accomplished without difficulty. Convalescence was uneventful and the patient left the hospital on the eighth postoperative day.

Pathologist's report. The appendix, with a sausage-shaped tumefaction of the distal three-quarters, weighed 106 gm. The proximal undilated segment was 35 mm. long and 5 mm. in diameter and its lumen was obliterated in the distal 10 mm. Beyond the obliteration was a dilated tense mass 115 mm. long and 40 mm. in diameter. The serosa was smooth, glistening gray-purple, mottled with dark red. The mesoappendix was thickened and hemorrhagic. The leathery wall varied from 0.5 mm. to 2 mm. in thickness and contained spicules of calcification. The gelatinous content was translucent gray to opaque dull yellow (Figure 2). Upon microscopic examination of a section, the wall was observed to be composed of compact laminations of hyalinized collagen connective tissue infiltrated with occasional lymphocytes, plasma cells and neutrophilic polymorphonuclear leukocytes. There was no mucosa. Fine calcifications were imbedded along the inner surface. Compressed smooth muscle, present only on the mesoappendicial border, was undergoing necrobiosis. Dilated veins and dense extravasations of erythrocytes were noted throughout the wall, particularly in the less compact subserosa. In the undilated proximal segment the lumen was obliterated by dense fibrous connective tissue.

Pathologic diagnosis: Mucocele of the appendix with early gangrene.

SUMMARY

A case of mucocele of the appendix complicated by torsion and consequent gangrene is reported. Two previous instances of this complication have been recorded.

18 Canon Drive.

REFERENCES

1. Bergan, F.: Pseudomyxoma peritonei e processu vermiforme—an experimental study, Acta path. et microbiol. scandinav., 27:537, 1950.

2. Bonnan, L. J., and Davis, J. G.: Retroperitoneal mucocele of the appendix, Radiology, 51:375, 1948.

3. Bunch, G. H.: Mucoid disease of the appendix, Ann. Surg., 121:704, 1945.

4. Cheng, K. K.: An experimental study of mucocele of the appendix and pseudomyxoma peritonei, J. Path. and Bact., 61:217, 1949.

5. Grodinsky, M., and Rubnitz, A. S.: Mucocele of the appendix and pseudomyxoma peritonei, S. G. & O., 73:345, 1941.

6. Heatley, T. F.: Hemorrhagic mucocele of the appendix, J.A.M.A., 112:1935, 1939.

7. Lentino, A. S.: Appendicular mucocele and torsion of the appendix, Semana Med., 1:254, 1946.

8. Ostrum, H. W., and Miller, R. F.: Calcified mucocele of the appendix with rupture, Radiology, 36:356, 1941.

9. Rosenfeld, E. D.: Peritoneal pseudomyxoma, Arch. Path., 48:255, 1949.

10. Rubnitz, A. S., and Hermann, H. T.: Experimental appendicial mucocele, myxoglobulosis and peritoneal pseudomyxoma, Arch. Path., 36:297, 1943.

Cholecystitis and Cholelithiasis in a 16-Year-Old Boy

HENRY HIRSCH, *M.D.*, EARL B. RAY, *M.D.*, and MORRIS E. FREEDLAND, *M.D.*, Bellflower

THE AMERICAN MEDICAL LITERATURE contains little information on gallbladder disease in children and adolescents. Infants and children rarely have calculi in the gallbladder.[1] Acute cholecystitis, when it occurs in childhood, frequently is associated with bacterial infection such as scarlet fever, typhoid fever and septicemia.[1] Complications from obstruction of the gallbladder by intestinal nematodes have been reported.[1] Cholelithiasis in childhood is considered by some investigators to be in most cases a complication resulting from sickle cell anemia in Negroes and from congenital hemolytic anemia in Caucasians. Reports of cases in which coexistence of cholecystitis and cholelithiasis was proved by pathological examination, as in the following instance, are few.