Ureteral injuries usually result from penetrating abdominal trauma or iatrogenic causes. The reported incidence of penetrating ureteral injuries is 2.2 to 5% of all abdominal missile wounds, 17% of all penetrating genitourinary trauma (1). The total incidence of ureteral injury has been reported to be less than 1% of all urologic trauma (2). The diagnosis of ureteral injury is often delayed due to the critical condition of the patient following gun shot injury (3,4). Delay in diagnosis also appeared to contribute to an increased morbidity in a patient with a penetrating injury. We report a case with 40 days delayed diagnosis of ureteral injury and a large urinoma formation following exploratory laparotomy.

**Case Report**

A 21-year-old man with 40 days ago performed laparotomy due to right iliac and umbilical region gun shot injury was referred from his local physician complaining of shaking chills, high fever, malasia, right gluteal swelling and
watery discharge. Physical examination revealed fistula and wide gluteal swelling (Figure 1) due to subcutaneously enlarged urinoma. Laboratory tests were showed leucocytosis and Klebsiella pneumonia in blood. Intravenous pyelography (IVP) showed a poorly functioning right kidney. He had a terminal colostomy located in left iliac region. Computed pelvic tomography (CT) showed intrapelvic giant urinoma extending to right gluteal skin through the sacral deformity due to gunshot injury (Figure 2). Retrograde pyelography revealed distal right ureteral extravasation near intramural ureter. 1200cc urine was drained from gluteal fistula tract. We did not try to place a double J catheter retrogradly to avoid ureteral avulsion. In the second step, we performed right percutaneous nephrostomy as a diversion. Tree months later, 1 cm ureteral stricture located in the early extravasation region was shown antegradly. Reconstruction with psoas-hitch and ureteroneocystostomy was performed.

Discussion

Nearly all patients with penetrating abdominal trauma should undergo exploratory laparotomy (1). However the true extend of injury in missile wounds is not immediately obvious due to blast effect even with relatively low velocity bullets (5). The kinetic energy of such a missile transmits an explosive reaction with in the wound resulting in extensive damage to the surrounding tissues. This type of missile passes through the tissues nearly but creates a cavity 30 to 40 times it’s size because of exertion of hight pressure on adjacent tissues. The violence of expansion of missile tract disrupts and devitalizes tissue, blood vessels and bones at a distance from the path of the missile (6). The possibility of ureteral injury should be considered not only in the form of laceration or transection but also contusion alone, which might lead to future extravasation. Contusion damages the intima of small blood vessels in the ureter and produces thrombosis, ischemia and delayed necrosis resulting urinary leakage (7-9). The extravasated urine causes lipolysis and stimulate on intense fibrous reaction which forms a thick wall. The lipolysis may be due to a mass effect as no direct effect of the urine on adipocytes has even be demonstrated (10).

We report the case with lately diagnosed giant intrapelvic and cutenously enlarged urinoma. To ourknowledge, this is the first case as a likely giant and lately formed urinoma (40 days later from gunshot ureteral injury). Urologist deal with trauma should not forget the blast effect of a missile, and should be aware of urinoma formation following gunshot injury despite exploratory laparotomy.
REFERENCES


