

Three Cases of Primary Psoas Abscess Accompanied With Digestive Malignant Diseases : Especially Evaluation of Clinical Feature and its Pathogenesis of the Three Cases

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The insidious onset and occult characteristic of primary psoas abscess (PA) can cause diagnostic delays, resulting in high mortality and morbidity rates. In this article, three patients with PA accompanied with digestive malignancies visiting to my facility are reported. All patients had severe low back pain radiating to the ipsilateral foot, difficulty in walking over several days and suffered from high grade fever, malaise, loss of appetite. The presence of PA was examined by abdominal ultrasonography (AUS) and Computed tomography (CT). PA was drained percutaneously or surgically. Postoperatively, those patients were administered antibiotics at another hospital. Culture of abscess of PA showed *Streptococcus agalactiae* in case 1, *Escherichia coli* and *Staphylococcus aureus* in case 1 and case 2 respectively. One patient died of multiple organ failure. The present 3 patients were accompanied with digestive malignancies. There has been advocated some kinds of factors concerning about pathogenesis of PA. Furthermore, there has been reported some cases of PA accompanied with colon cancer. But there has been no case reports of PA accompanied with gastric cancer or hepatocellular carcinoma in the light of the literature inside and outside of Japan. Lumbar pain is a generally common disease, but we must pay attention to the existence of PA and search into its pathogenesis if we encounter the patient with severe lumbar pain, high grade fever. In conclusion, PA is a rare disease usually causing misdiagnosis or delayed diagnosis. The present re-

port is an instructive daily clinical experience.

Key Words: Psoas abscess, Malignant disease, Drainage of abscess, antibiotics

INTRODUCTION

Primary psoas abscess (PA) is considered a rare but potentially fatal disease in the literature. Diagnosis is often delayed due to vague and occult clinical presentations. It may be classified as primary or secondary depending on the identifiable existence of the underlying disease. In Asia and Africa, 99.5% of PPA are primary compared to 61% in North America and 18.7% in Europe [1, 2]. Most of PA, 87.5% of cases, are caused by a single organism. *Staphylococcus aureus* is the most commonly isolated pathogen up to 88%, followed by *Streptococcus spp.* (4.9%) and *Escherichia coli* (2.8%) [2]. Certain *streptococcal species*, including *Streptococcus agalactiae* [3-6], *Streptococcus pneumoniae* [7], *Streptococcus milleri* [8], group A *beta-hemolytic streptococcus* [9], and *Streptococcus viridians* [6] have been published to cause PA. Between January, 2003 and December, 2010, I experienced three cases of PA accompanied with digestive malignancies. The treatments employed for PA in two patients were administration of intravenous antibiotics and percutaneously or surgically drainage, debridement of abscess and resection of the infected part. The remaining one patient was recovered by intravenous administration of antibiotics without drainage procedure. No standard treatment has been established yet, however, conservative treatment is believed to yield poor result and an advantage with open drainage is that debridement of adjacent tissues can be done, which may help in shortening the re-

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covery time. There has been advocated some kinds of factors concerning about pathogenesis of PA. Furthermore, there has been reported some cases of PA accompanied with colon cancer. But there has been no case reports of PA accompanied with gastric cancer or hepatocellular carcinoma in the light of the literature inside outside of Japan. In this point, the present three cases are thought to be very rare cases. Accordingly, in this article, the precise clinical features of PPA of the present 3 patients and its pathogenesis of PPA in each case were analyzed. In conclusion, my clinical experience indicated that early diagnosis, promptly treatment and bacterial identification were necessary for the patient with PA.

CASE REPORT

CASE 1

A 72-year-old man visited to my facility for the chief complaint of left back pain and high grade fever of unknown origin about ten years and six months ago. Until visiting to my facility, he received intravenous administration of antibiotics for seven days at another nearby facility with the diagnosis of unknown origin of fever. But he never relieved from high grade fever and left lumbar back pain. On his arrival at my facility, apart from left-sided low back pain radiating to the ipsilateral foot, he complained about high grade fever, left-sided low back pain and difficulty in walking over 7 days. Furthermore, he also experienced malaise, loss of appetite, weight loss (from 56 to 52 kg). Plain films of thoracolumbar spine revealed lumbar scoliosis, convexity to the right and no evidence of osteolytic or osteoblastic lesion. Abdominal ultrasonography (AUS) at my facility depicted a heterogenous hypoechoic lesion at the left psoas muscle, measuring 2.7×2.6 cm in size and Compute Tomography (CT) scanning also demonstrated low density mass 3.0×2.7 cm in size covered with a ring (Fig. 1). As correlated to clinical setting, he was diagnosed as left-sided PA at my facility and transferred to Shimane Prefectural Central Hospital and to receive adequate a treatment. On admission, initial vital signs were abnormal as follows: body temperature 38.7°C, pulse rate 110 beats/minute,

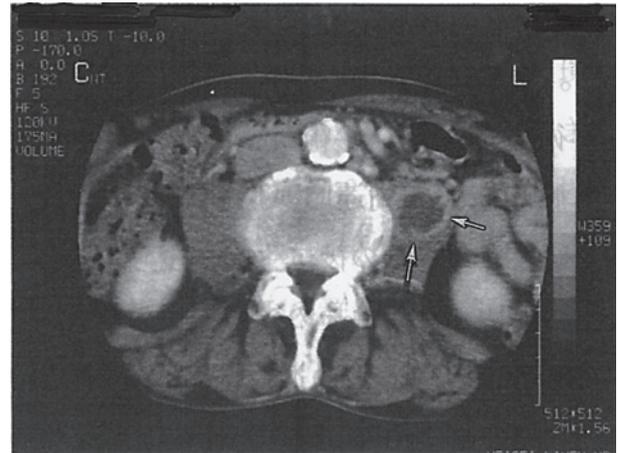


Fig. 1. CT scanning at visiting my facility of case 1 demonstrated left side-PA.

respiratory rate 22 breaths/minute, blood pressure 113/67 mmHg. On physical examination, he looked sick and always flexed his left hip in supine position. The markedly tenderness at left lower back was observed. The pain was aggravated by psoas test in the affected limb. The laboratory investigations demonstrated markedly leucocytosis and mildly anemia (white blood count of $28.4 \times 10^3/\text{ml}$ and hematocrit of 28.4%). Liver function test and renal function test were within normal limits. The premeal blood sugar was elevated to 275 mg/dl. Because surgical drainage was performed due to lack of percutaneous drainage resource, drainage of the abscess under general anesthesia and postoperative systemic treatment by antibiotics were performed to this patient. Approximately one-hundred ml of frank pus was drained and penrose drain was kept in situ. Microbiology reported pure growth of *Streptococcus agalactiae*, sensitive to penicillin and clindamycin, the same pathogen in previous hemoculture as a causative organism. Penicillin G and clindamycin were administered for 7 days after operation. Within 5 days postoperatively, the patient became afebrile and looked well. The general condition was gradually improving. The drain was removed whereas intravenous antibiotics were switched to oral form and continued for 14 days. Subsequently, he was discharged at day 35 of admission without morbidity. He had done well on the 3 week follow-up day. However, he visited to my facility because of anemia at the time of 15 days after discharge and his laboratory data showed severe anemia (RBC

$226 \times 10^4/\text{mm}^3$ Hb 7.6g/dl, Ht 23%). His upper gastrointestinal tract was examined by Barium enema and gastroendoscopy and found an advanced gastric cancer (Fig. 2). He was also transferred to Shimane Prefectural Central Hospital and total gastrectomy with esophagojejunostomy by Roux-en-Y reconstruction was done. Postoperative course was good and discharged at 30 days after gastric operation.

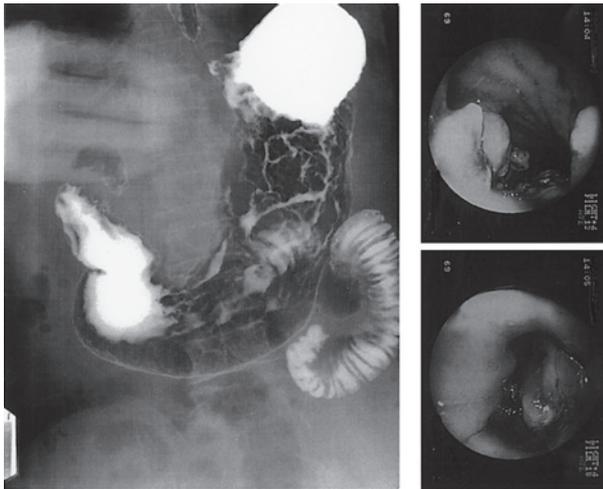


Fig. 2. Barium enema and endoscopy of the stomach in case 1 at visiting my facility after surgically drainage of PA showed that he had suffered from advanced gastric cancer mainly occupied gastric body.

CASE 2

A 78-year-old man visited to my facility for the chief complaint of right back pain and high grade fever of unknown origin about six years and ten months ago. Until visiting to my facility, he suffered from right ischialgia, high grade fever and gait disturbance. Immediately AUS at my facility depicted a heterogenous hypoechoic lesion at the right psoas muscle, measuring 5.3×5.4 cm in size and CT scanning also demonstrated low density mass 5.6×5.9 cm in size covered with thickened wall (Fig. 3). At my facility, initial vital signs were abnormal as follows: body temperature 39.7°C, pulse rate 120 beats/minute, respiratory rate 24 breaths/minute, blood pressure 96/68 mmHg. On physical examination, he looked very sick and always flexed his right hip in supine position. The pre-meal blood sugar was elevated to 125 mg/dl. Plain films of thoracolumbar spine revealed mild lumbar scoliosis, convexity to the left and no evi-

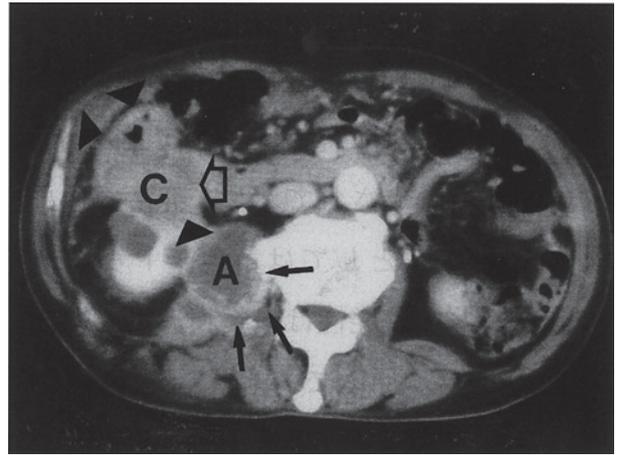


Fig. 3. CT scanning at visiting at my facility of case 2 showed both of the existence of advanced ascending colon (⇒: C) and right side PAA (→: A)

dence of osteolytic or osteoblastic lesion. The markedly tenderness at right lower back was observed. As correlated to clinical setting, right-sided PA and advanced ascending colonic cancer were found and there was a connection between cancer lesion and PA by CT scanning. Immediately he was transferred to Shimane Medical University hospital and admitted to receive a treatment. On admission, he was in the state of septicemia with worst condition, so promptly emergent operation of drainage of abscess of the right-sided PPA was done through pararectal incision under general anesthesia. Approximately one-hundred fifty ml of frank pus was drained and penrose drain was kept in situ. Microbiology reported pure growth of *Escherichia coli*, sensitive to flomxef sodium, the same pathogen in previous hemoculture as a causative organism. After operation, he received intravenous administration of antibiotics of flomoxef sodium for 7 days and his condition was doing well gradually. Because his condition was stable, further examination about intestinal tract was performed. Barium enema revealed that irregular walled ulcerative cancer lesion was recognized (Fig. 4) and advanced gastric cancer was found by upper gastroendoscopy. This patient had suffered from double cancers. On the 13th days after admission, palliative right hemicolectomy of colon cancer because of peritoneal dissemination and distal gastrectomy were done to this patient to relieve the stenosis of the intestinal tract by colon cancer. The resected specimens showed that Borrmann III typed advanced colon cancer and Borrmann II typed

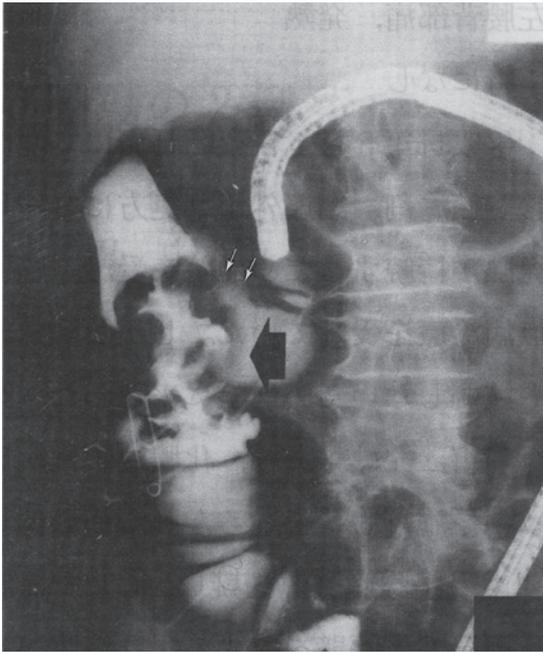


Fig. 4. Barium enema after surgically drainage of the PA of cases 2 showed that Borrmann III type advanced ascending colon cancer(→) and connection between the colon cancer and PA cavity(⇒).

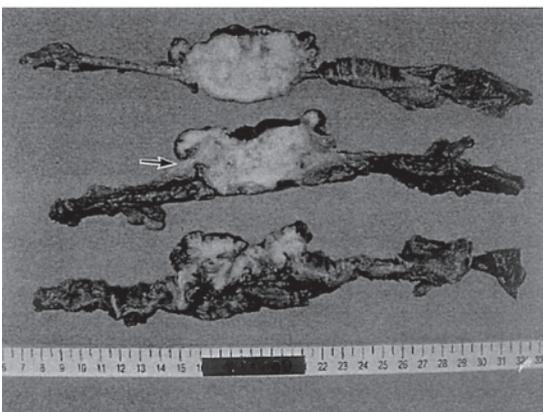
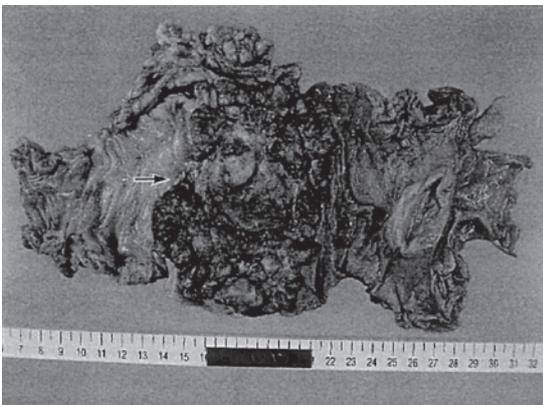


Fig. 5. The macroscopic view of the resected specimen of the colon cancer of case 2 demonstrated Borrmann III typed cancer (upper side: ⇒) and invasion to outside surface of the serous surface of the colon (lower side : ⇒).

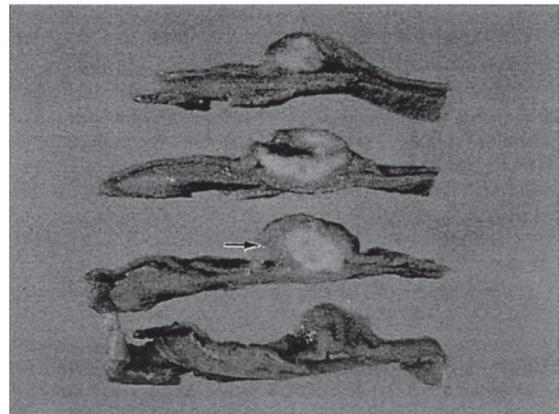


Fig. 6. The macroscopic view of the resected specimen of case 2 showed IIc like advanced gastric cancer (upper side:⇒) and invasion to the subserosal area of the stomach (lower side : ⇒).

advanced gastric cancer (Fig. 5 and Fig. 6). Pathohistological examination showed that colonic cancer was composed of moderate differentiated adenocarcinoma and gastric cancer was composed of highly differentiated adenocarcinoma. After cancer operation, he looked well, but his general condition was gradually worsening and he experienced malaise, loss of appetite, weight loss (from 48 to 39 kg). After postoperative 45days of cancer operation, he was fallen into sepsis and died of multiple organ failure and acute respiratory failure because of advanced cancer.

CASE 3

A 75-year-old man visited to my facility for the chief complaint of right back pain and unknown origin of high grade fever about five years six months ago. About seven years ago, he received hepatic resection because of hepatocellular carcinoma. Fig. 7 demonstrated a liver mass at the

diagnosis of hepatocellular carcinoma by Magnetic Resonance Imaging (MRI) at preoperative time. After hepatectomy his general condition was uneventful. Furthermore, he was also treated by medications for both of diabetes mellitus and hypertension. His fasting blood sugar level was 136mg/dl and hemoglobin A_{1c} was 6.9%. However, five years and six months ago, he visited to my facility for suffering from right ischialgia, high grade fever and gait disturbance. Immediately AUS at my facility depicted a heterogenous hypoechoic lesion at the right psoas muscle, measuring 1.2cm×1.5 cm in size and CT also demonstrated low density mass 1.3×1.6 cm in size and dilatation of small intestine

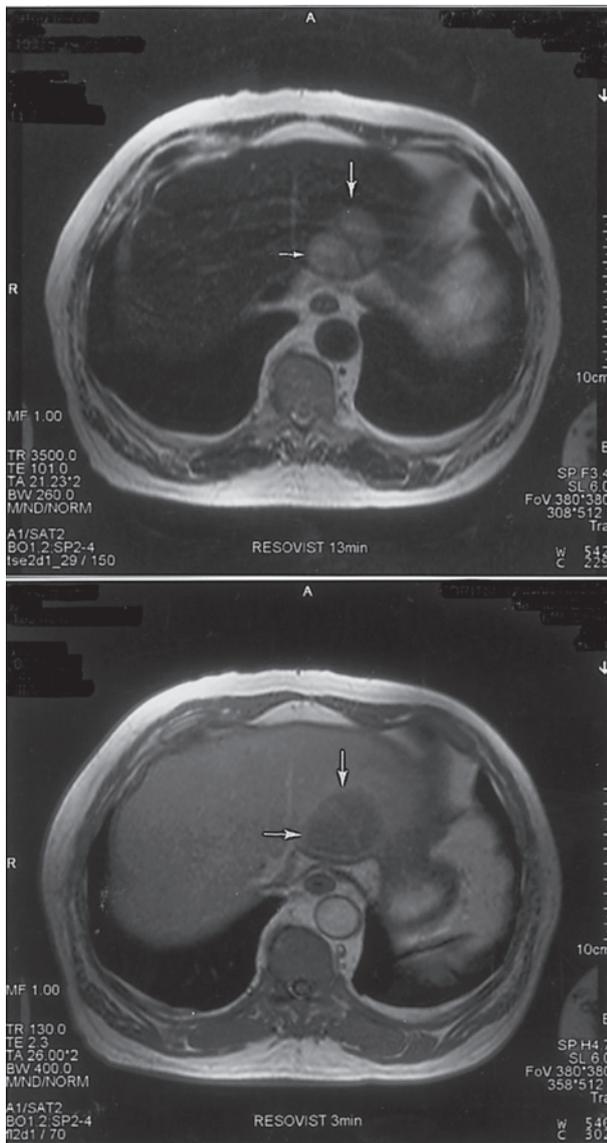


Fig. 7. MRI at visiting my facility of case 3 showed a hepatic tumor (HCC) at the left lateral area of the liver(→T₁ ;imaging; upper, T₂ ;imaging; lower).

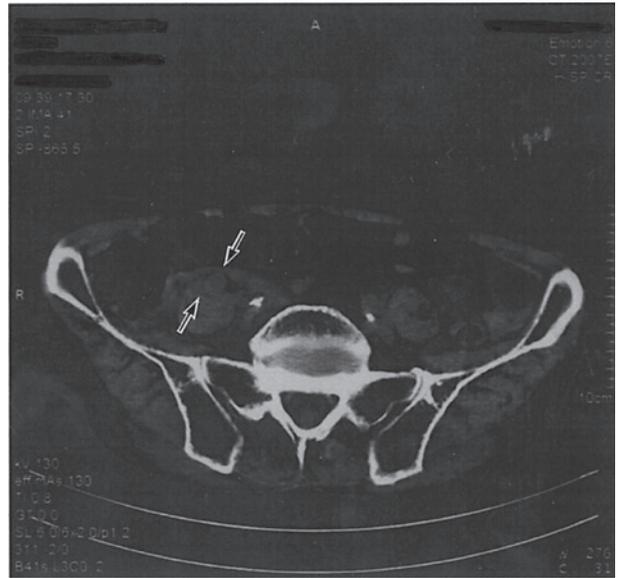


Fig. 8. CT scanning at visiting my facility of case 3 demonstrated right side-PA(→).

suggesting subileus (Fig. 8). At my facility, initial vital signs were abnormal as follows: temperature 38.5°C, pulse rate 98 beats/minute, respiratory rate 18 breaths/minute, blood pressure 124/86 mmHg. On physical examination, he looked sick and always flexed his right hip in supine position. The pre-meal blood sugar was elevated to 186 mg/dl. Plain films of thoracolumbar spine revealed no lumbar scoliosis and no evidence of osteolytic or osteoblastic lesion. As correlated to clinical setting, right-sided PPA was diagnosed by CT scanning and transferred to Unnan City Hospital. On admission, percutaneous drainage of the abscess was done and microbiology reported pure growth of *staphylococcus aureus* sensitive to flomoxef sodium. Intravenous administration of fulomoxef sodium was selected for ten days with percutaneously drainage. He became afebrile and looked well. His general condition was rapidly improving and he discharged after 30days after admission.

DISCUSSION

PA is considered a rare infection with vague and occult clinical presentations. Serious complications such as septicemia and mortality may be a consequence if initial diagnosis and prompt treatment are delayed. It is classified as primary or secondary, depending on the existence of the underlying disease.

PA occurs probably as a result of hematogenous dissemination from an occult primary infectious focus or secondary to local trauma with intramuscular hematoma formation predisposing to abscess formation [10]. Worldwide differences in its etiology were observed [1, 2]. Most PA (70%) occur with a male preponderance of 3: 1 [1, 2, 11]. Fifty seven percent of the PA occur on the right side, 40% on the left side, and 3% bilaterally [11]. The most common cause of secondary PA is Crohn's disease (60%). The remainder belong to appendicitis (16%), ulcerative colitis, diverticulitis, colon cancer and vertebral osteomyelitis [2]. A 2. 4% mortality rate of PA is shifted to 19% of secondary abscesses relating to its co-morbidity. The mortality rate is 100% if the patient is not treated [12]. The high risk factors of PA include diabetes mellitus, intravenous abuse, AIDS, renal failure [13] and immunosuppressive state [12]. PA is caused by a single pathogen in 87. 5% of cases. The most commonly causative organism is *Staphylococcus aureus* (88%), followed by *streptococcus* (4.9%) and *Escherichia coli* (2.8%). Other reported pathogens are *Pasteurellaspp.*, *Proteus spp.*, *Staphylococcus epidermidis*, and *Salmonella spp.* Several streptococcal species have been reported causing PA, including *Streptococcus agalactiae*, *Streptococcus pneumonia*, and *Streptococcus milleri*, group A *beta-hemolytic streptococcus* and *Streptococcus viridians* [2, 9]. Positive blood cultures, usually for *Staphylococcus aureus*, are reported in 41.7% of cases [2]. *Streptococcus agalactiae* or group B *streptococcus* is not only an infrequent organism to cause PA but a common cause of sepsis and meningitis in newborns and pregnant women [13]. In the study of Huang et al [14], underlying systemic disease was found in 81% of patients, with the most frequent being malignancy (43.6%), diabetes mellitus (42. 6%) and liver cirrhosis (16%).

The classical clinical triad of PA including fever, back pain and limp is present in only 30% [7]. As the psoas muscle is innervated by L2-L4, radiating pain to hip, thigh, and calf can be noticed. Additional symptoms are discomfort, malaise, nausea, weight loss, anorexia, vague abdominal pain, palpable mass in iliac or inguinal area [1, 2, 11, 12]. A physical examination may reveal the typical

supine position with moderate knee flex and mild external hip rotation. Psoas sign may be positive, as well as active flexion of the affected hip against the pressure aggravates pain. Laboratory studies may disclose a leucocytosis, anemia, raised C reactive protein and erythrocyte sedimentation rate [12]. AUS is a noninvasive safe, cost effective and available diagnostic investigation with sensitivity 40-60% of the cases [2, 7, 12]. The hetero-gencous hypoechoic mass reflects the abscess. A CT scanning is now considered as the gold standard for definitive diagnosis, having a 91-100% sensitivity [7] and it is also employed to identify the etiology in the case of secondary PA is suspected [8]. Differential diagnoses of PA include hip arthritis, hip avascular necrosis, irritable hip, necrotizing fasciitis of psoas muscle, inflammatory bowel diseases, retrocecal appendicitis, pyelonephritis, pelvic inflammatory disease, herniated L5/S1 disc, vertebral or pelvic osteomyelitis and epidural abscess [7, 11].

Treatments consist of appropriate antibiotics and early drainage of the abscess. Empirical antibiotic treatment is guided by a knowledge of local causative pathogens and susceptibility test, varying to global geography. In the past, anti-Staphylococcal antibiotic is suggested as empirical treatment for PA due to the commonest [1]. However, because of an increasing incidence of non-Staphylococcal PA such as the presented cases, some authors recommend broad spectrum antibiotics [8]. Specific antibiotics are formulated according the microbiological report and *Penicillin* still remains the drug of choice [15, 16]. Firstly, percutaneous drainage should be considered as initial procedure of choice [12]. Surgical drainage can shorten the hospital stay and recovery time [17] in the case of failure of percutaneous drainage or having of coagulopathy. Simultaneous resection of the adhesive bowel and drainage of the abscess is necessitated in the patient with colonic cancer or crohn's disease. High mortality and morbidity rate are associated with inadequate or delayed drainage of abscess [2]. From these facts, it is very important to clarify the exact mechanism of PA in the present cases.

The present 3 cases were complicated with digestive malignancies. In the light of the literature, PA accompanied with gastric cancer like case 1

and case 2 was thought to be a first report. As seen in case 1, complication with PA and digestive malignancy was not accidentally event. It was strongly suspected that there was a close connection between them. Namely, it was speculated that host immunoreactivity against bacteria invasion was disturbed. Accordingly, *Streptococcus agalactiae* easily invaded into psoas muscle through blood flow from some focus of infection inducing PA. In case 2, the patient suffered from advanced colonic cancer and advanced gastric cancer. Like case 1, immunoreactivity was also disturbed. Furthermore, advanced colonic cancer was suspected to invade into the right psoas muscle directly, eventually inducing PA by *Escherichia coli*. This case was the first report of PA accompanied with double cancers. In case 3, hepatocellular carcinoma occurred with a background of non alcoholic steatohepatitis (NASH) without viral hepatitis, but its pathogenesis was speculated to be a suppression of immunoreaction by both of diabetes mellitus and cancer. There have been some cases reports of PA accompanied with colonic cancer, however there was not a case report of PA with accompanied with digestive malignancies other than colonic cancer. In this point, the present 3 cases were very important and instructive in diagnosing lumbar pain, if we encounter the patient with cancer. From these facts, it was indicated that immunosuppressive state of the patient with malignancies might be attributed to PA in the elderly patients and we might firstly pay attention to the existence of PA attributed to cancer other than diabetes mellitus, liver scirrhus or renal dysfunction, if we encountered patients with high grade fever and sever lumbar pain.

In conclusion, PA is an infrequent disease usually causing misdiagnosis or delayed diagnosis. To reduce morbidity and mortality of PA, early diagnosis and promptly treatment are necessary. The strategy comprises appropriate empirical antibiotics and prompt drainage either percutaneously or surgically followed by a course of proper antimicrobial agents regarding further identified causative pathogens.

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