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Case Report

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Vertebral Metastasis from Squamous Cell Carcinoma of the Anal Canal

Distant metastasis of squamous cell carcinoma from the anal canal is an uncommon event. However, hematogenous spread to the vertebrae may occur in the course of this disease. The route of metastasis from the anal canal seems to be Batson's vertebral venous system. A 52-year-old female patient presented with lower back and right leg pain of one-week history. She has undergone radiotherapy and chemotherapy for squamous cell carcinoma of the anal canal and then was followed by surgical resection. Three months later, magnetic resonance images of the lumbar spine disclosed a well-enhanced mass of L5 vertebral body compressing the thecal sac. Surgical decompression and biopsy were performed. Histopathological study confirmed carcinoma of the squamous cell origin. We report a rare case of vertebral metastasis from squamous cell carcinoma of the anal canal with a pertinent review of literature.

KEY WORDS : Squamous cell carcinoma · Metastasis · Vertebra · Anal cancer.

INTRODUCTION

Anal cancer is relatively rare neoplasm representing 1-6 percent of anorectal cancers[1,2]. Squamous cell carcinoma is the most common histological type. Distant metastasis from squamous cell carcinoma of the anal canal is uncommon event, which has been reported as a rare occurrence[3,5,6]. It typically occurs in liver and lung[5,6]. However, vertebral metastasis from squamous cell carcinoma of the anal canal has not been reported yet in the literature. To our knowledge, this is likely to be the first report of vertebral metastasis from squamous cell carcinoma of the anal canal. We summarize our case and review its pathophysiology with the pertinent literature.

CASE REPORT

A 52-year-old female patient was referred to our neurosurgical department because of lower back and right leg pain of 1-week history. She felt severe throbbing and lancinating pain which was not relieved even by strong opioids such as morphine, oxycodone. Neurological examinations revealed weakness of right ankle (grade III), dysesthesia in right L5-S1 dermatome and voiding difficulty. Magnetic resonance images of the lumbar spine showed a well-enhanced mass of L5 vertebral body compressing the thecal sac (Fig. 1A, B).

Eight months earlier, she had been diagnosed as squamous cell carcinoma of the anal canal after endoscopic biopsy and then underwent loop ileostomy because of anal obstruction. Radiotherapy (6,100 cGy / 11 weeks) and adjuvant chemotherapy with capecitabine, 5-fluorouracil and mitomycin C were done. Enhanced abdominopelvic computed tomographic (CT) scans for evaluation of post-radiotherapy / chemotherapy showed an infiltrating, encircling, 3.5×4.0 cm-sized anal mass with posterior vaginal wall invasion and fistula, perirectal lymph node metastasis (Fig. 1C). The size of the anal mass still remained unchanged significantly. Therefore, she underwent surgical resection of the lesion and hysterectomy with bilateral salphingo-oophorectomy for rectovaginal fistula. The histopathological examination proved to be a well-differentiated squamous cell carcinoma of the anal canal (Fig. 2A). Three months later, follow-up CT scans showed no recurrence of the lesion, but revealed newly a hydroureter due to left upper ureteral metastasis and an expansile destructive lesion of L5 vertebral body with severe encroachment of the spinal canal (Fig. 1D). Radioisotope bone scans revealed hot uptake lesions in L5 vertebra and right portion of manubrium.

We planned operation for histopathological diagnosis and possible decompression of the

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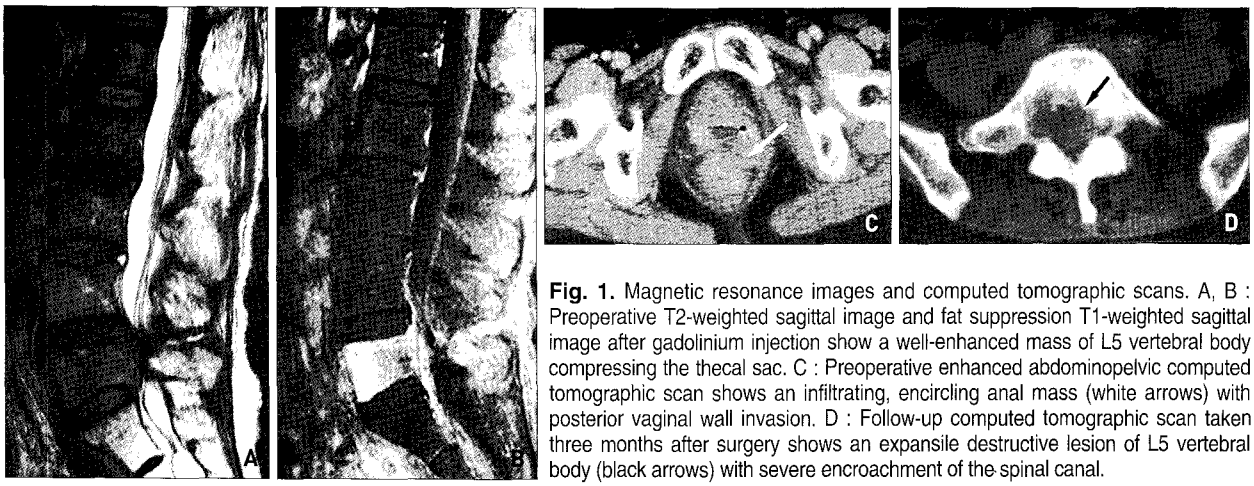

Fig. 1. Magnetic resonance images and computed tomographic scans. A, B : Preoperative T2-weighted sagittal image and fat suppression T1-weighted sagittal image after gadolinium injection show a well-enhanced mass of L5 vertebral body compressing the thecal sac. C : Preoperative enhanced abdominopelvic computed tomographic scan shows an infiltrating, encircling anal mass (white arrows) with posterior vaginal wall invasion. D : Follow-up computed tomographic scan taken three months after surgery shows an expansile destructive lesion of L5 vertebral body (black arrows) with severe encroachment of the spinal canal.

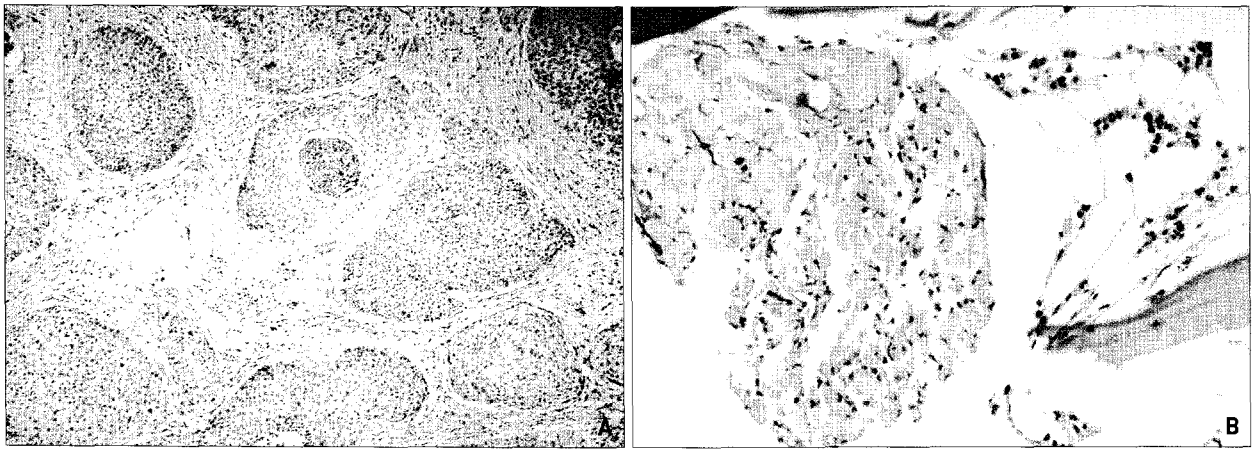

Fig. 2. Photomicrographs of the tumor specimens. A : The section from the anal canal shows well-differentiated squamous epithelial cell nests. A keratin pearl is also noted in the central portion of the specimen. B : The section from L5 vertebral body shows carcinoma cell clusters of the squamous cell origin. Note the adjacent bone and marrow tissues (H & E, A : ×100, B : ×400).

affected nerve roots because of intractable sciatic pain and weakness. Following laminectomy L5, the affected nerve roots were decompressed. Interestingly, there was no gross epidural invasion of the cancer, with intact posterior longitudinal ligament. While the bulged posterior longitudinal ligament was ruptured by a sharp dissector, pus-like, whitish materials were gushed out. Histopathological study demonstrated vertebral metastasis of squamous cell carcinoma. Postoperatively, her intractable sciatic pain was partially improved but, lower back pain was not relieved. Additional radiotherapy of metastatic disease of L5 vertebra has not been performed because of poor general condition and wound problem of the operation site. She died 8 weeks postoperatively due to multiple organ failure and sepsis caused by wound infection of the anal canal.

DISCUSSION

Squamous cell carcinoma is the most common histological type of anal cancers, which is primarily a local disease with approximately 70% of tumors apparently limited to the bowel wall[2]. Lymphatic metastases and local invasion into contiguous structures, such as the vagina, rectum, and bladder are the main spreading patterns of anal cancers. On the other hand, distant metastasis via hematogenous route is an uncommon event and its incidence comprises only 2% of patients with anal cancer[2]. Distant metastasis of anal cancers usually occur in the liver or lung[5,6]. But, it may also be seen infrequently in bone or skin[5]. However, vertebral metastasis from squamous cell carcinoma of the anal canal is very rare. We could not encounter any such case in the medical literature despite an intensive Medline search of reports from the last 30 years.

Vertebral metastasis from carcinomas typically occurs via hematogenous route. A possible anatomical pathway is the vertebral venous system, a network of anastomosing venous channels between the pelvis and vertebrae as originally described by Batson[1]. Injection experimental study in living monkeys, with simulated abdominal straining, revealed that the venous flow from pelvic veins is into the vertebral venous

system[1]. It is also suggested that manipulation at operation may play a role in hematogenous metastasis of anal cancer[6]. A well-documented case of the dorsal spine metastasis from squamous cell carcinoma of the penis was reported[7] that seems to be similar to our case.

Hematogenous metastasis is very uncommon even in those with advanced stage of squamous cell carcinomas and has not been yet established. It may be due to the fact that adenocarcinomas have a strong tendency of blood-borne metastasis but, on the contrary, carcinomas of the squamous cell origin predispose to local invasion or lymphatic spreading. The first step of metastasis of malignant tumors is penetration of tumor cells into lymphatics and blood vessels. It is a mechanical process, the endothelial injury resulting mechanical stretching with the growth of tumor cell nests and lymphatic invasion is much simpler than blood vessel invasion[9,10]. This fact is possibly because the wall of blood vessels has a firm basement membrane lining which is much stronger than that of lymphatic vessels. Recently, it has become well known that sialyl Lewis X antigen, the cancer-associated carbohydrate antigen, is associated with hematogenous metastasis of cancers[4,8] and is expressed more frequently on the cell surface of adenocarcinoma than the squamous cell type[4].

The treatment goal of metastatic spinal disease is to preserved neurological function and to relieve pain. A recent randomized trial has demonstrated that combination of direct decompressive surgery and radiotherapy was superior to radiotherapy alone for the treatment of metastatic spinal cord compression and especially, surgical resection before radiotherapy was more effective[11]. Therefore, more active surgical treatment should be considered in patients with symptomatic metastatic spinal disease.

CONCLUSION

We report a rare case of vertebral metastasis from squamous cell carcinoma of the anal canal. Hematogenous spread to the vertebrae may occur in the course of this disease. The route of metastasis from the anal canal seems to be Batson's vertebral venous system. Surgery as first-line therapy followed by radiotherapy is likely to be the standard treatment.

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