Spondylodiscitis and Infective Endocarditis Caused by Streptococcus bovis in a Patient with Colon Cancer

Cheng-Wei Wang, Yu-Ming Jian, Rong-Sen Yang

Abstract

Musculoskeletal symptoms are complaints especially common in the elderly. Similar symptoms also occur in patients with infective endocarditis; they are often treated as rheumatic or degenerative diseases. In patients with infective endocarditis, symptoms may also be complicated with vertebral osteomyelitis, especially streptococcal infective endocarditis. Literature review indicates that, in patients, especially the elderly who have bacteremia and/or endocarditis from *Streptococcus bovis*, investigation of colonic lesions is optimal. The study reports a 64-year-old male patient with initial presentation of exertional dyspnea. Bacteremia and endocarditis from *S. bovis* was diagnosed. Colonoscopy showed a colon cancer in early stage over cecum. The patient underwent right hemicolectomy and had new onset of severe low back pain during this period. Magnetic resonance imaging revealed spondylodiscitis over low lumbar spine. He underwent debridment and anterior interbody fusion. Under the cover of antibiotics, he recovered well. For patients, who have bacteremia and/or endocarditis from *S. bovis*, screening test should be arranged under the suspicion of colon lesion, especially in the elderly. Moreover, the musculoskeletal symptoms should be treated with care for the possibility of infection.

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**Key words:** spondylodiscitis, endocarditis, Streptococcus bovis, colon cancer

Department of Orthopedic Surgery, National Taiwan University Hospital
Correspondence to: Rong-Sen Yang,
No. 7, Chung-Shan South Road, Taipei, Taiwan (Department of Orthopedics, College of Medicine, National Taiwan University, Hospital)
Tel: (886) 2-312-3456 Ext. 63958 Fax: (886) 2-393-6577
E-mail: rsysang@ntuh.gov.tw


Introduction

The association between spondylodiscitis and endocarditis was first reported in 1965 [1]. The most common clinical picture is that low back pain of the spondylodiscitis precedes the diagnosis of endocarditis. On the other hand, the association of Streptococcus bovis endocarditis and adenocarcinoma of the colon was well established and has important clinical implications, since a neoplastic lesion can be discovered in the initial phase and a curative resection can be done [2]. We report an unusual case with the initial diagnosis of infective endocarditis complicated with low back pain due to spondylodiscitis. In addition, colon adenocarcinoma was also discovered by screening work-up colonoscopy due to the implication of S. bovis endocarditis.

Case report

A 64-year-old man has a history of chronic inflammatory demyelinating polyneuropathy. He was diagnosed in 1996 with initial presentation of distal limbs numbness and rapid progression to nearly complete paralysis. The patient responded well to plasma exchange, oral steroid, and Imuran. Fortunately, he could ambulate independently thereafter.

The patient had experienced progressive exertional dyspnea and intermittent fever over 38°C for 2 weeks before the admission in March, 2009. He also complained about decreased urine output and pitting edema over bilateral legs. Plain chest radiogram revealed increased infiltrations of bilateral lower lobes and cardiomegaly. Laboratory data showed leucopenia, anemia (WBC count: 2,900/mm³, hemoglobin: 6.4 g/dL), and elevated C-reactive protein level of 20.1 mg/dL. The patient had systolic murmur by cardiac auscultation, and echocardiography revealed a vegetation in 0.67cm diameter over mitral valve with severe regurgitation and left ventricular ejection fraction of 47%. Blood culture yielded S. bovis type I. Infective endocarditis was diagnosed by the Duke criteria. Parenteral penicillin G 3 million units per 6 hour was administered. The symptoms improved after antibiotics treatment without surgery.

However, about 6 days after admission, progressively deteriorating low back pain developed. Plain spine radiograms revealed a wedge shape deformity at L5 vertebral body with bony erosion at superior end-plate (Figure 1). Spine MRI studies showed abnormal signal at L 4-5 disc space with bony destruction at superior L5 vertebra, suspicious for L 4-L5 spondylodiscitis or
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metastatic lesion. Prominent epidural and paraspinal abscess or soft tissue was also noted (Figure 2). Parenteral Penicillin G was titrated up to 3 MIU per 4 hours and completed over a course of 6 weeks.

CT-guided biopsy for the vertebral lesion got, instead of malignant cells, only inflammatory cells. Tumor markers as CEA and CA19-9 were all within normal limits. Tc99m isotope bone scintigraphy revealed no other possible metastatic bone lesion. As a result, spondylodiscitis and epidural abscess were more likely although the culture of biopsy grew no pathogen. Because of the infrequent S. bovis bacteremia, the patient received stool occult blood test and colonoscopy. Stool occult blood test was negative and colonoscopy in April 2009 showed a tumor, non-granular pseudodepressed type, on cecum. Early colon cancer was suspected. No intra-abdominal metastasis was confirmed by abdominal and pelvic CT; the patient then received laparoscopic right hemicolecctomy in May 2009. The pathology report showed adenocarcinoma, Dukes stage A.

The patient, however, still complained of severe low back pain in the following days even after conservative treatment.
with Calcitonin, Teriparatide and back brace. The pain affected his daily activity so much that he could not even ambulate. Follow-up spine MRI studies in June 2009 revealed a persistent fluid signal in the L4-5 disc space with irregular contour of the adjacent endplates and abnormal signal and enhancement of the L4 and L5 bone marrow. The epidural soft tissue was no longer seen. Surgical intervention was arranged for the intolerable pain and definite histopathological diagnosis. Parenteral Penicillin G 3 MIU per 4 hours was administered again after the previous course was completed for 6 weeks.

In June 2009, the patient underwent disectomy, sequestrectomy of lower L4 and upper L5 vertebral body and anterior interbody fusion with autogenous iliac crest bone graft. Infectious discitis involving L 4-L5 intervertebral disc with bony destruction in the vertebral body was noted during operation, and the final pathology report showed chronic discitis and osteomyelitis without malignancy. Post-operatively, the patient wore Boston brace for further protection. Parenteral Penicillin G was administrated for 2 weeks, followed by Amoxicillin 1000mg orally per 8 hour for a course of 8 weeks. The bone graft incorporated well in the follow-up plain spine radiograms. The low back pain improved gradually after operation and physical therapy, and the patient could ambulate well with no assistance during the 3-month out-patient follow-up.

**Discussion**

Musculoskeletal symptoms are complaints especially common in the aging population. Similar symptoms also occur in patients with infective endocarditis and are often misdiagnosed as rheumatic or degenerative joint disease. Elderly patients have spondylitis that frequently present low back pain. Therefore, the intermittent attacks of back pain may delay the diagnosis of other lesions. In one study, arthralgia is the most frequent musculoskeletal complaint and involves most frequently the shoulder, followed by the knee, hip, and wrist. Low back pain is the second in frequency, affecting almost one third of the patients with infective endocarditis [3]. Many mechanisms have been suggested in the pathogenesis of these symptoms, such as bacterial emboli or immune complexes [4].

However, low back pain due to spondylodiscitis is uncommon in patients with endocarditis. In six retrospective reviews of a total of 1,045 patients with infective endocarditis, only 28 (2.6%) were diagnosed with vertebral osteomyelitis [3]. The association between spondylodiscitis and infective
endocarditis is still controversial, ranging from 0.6%~2.2%, when patients with established spondylodiscitis diagnosis were screened for infective endocarditis, to 10~15%, when patients with endocarditis diagnosis were screened for spondylodiscitis in retrospective studies [5].

From a microbiologic point of view, a distinctive sign between infective endocarditis associated with spondylodiscitis and spondylodiscitis alone may be the specific infective agent. Viridans streptococci and other kinds of streptococci have been found in a great majority of patients with infective endocarditis alone or combined with spondylodiscitis, whereas a staphylococcus species usually is identified in most patients with spondylodiscitis [6]. Besides, data from the literature underlines the importance of a preexisting heart valve disease as an important indication to search for infective endocarditis as the source of the spondylodiscitis [6]. In our patient, the onset of back pain was preceded by the diagnosis of infective endocarditis, which is an unusual clinical picture. It may be related to the previous spondylosis which may mask the back pain symptoms. The failure of conservative treatment and rest led to the suspicion of another infection focus in the spine, and the suspicion was finally confirmed by image studies and surgery. This demonstrated a process of the differentiation between the musculoskeletal complaints and spondylodiscitis in patients with infective endocarditis.

In general, patients with spondylodiscitis and abnormal cardiac auscultation must undergo echocardiography early, especially when there is a preexisting heart valve disease or the infective organism is a Streptococcus sp. On the other hand, patients with infective endocarditis must undergo vertebral evaluation if there is persistent back pain in spite of rest, persistent elevated inflammatory makers or fever, which should be considered as red flags for another site of infection such as the spine.

The occurrence of a bacterial endocarditis together with colon carcinoma was first reported in 1951[7]. It was not until 1977 that Klein et al. recognized S. bovis as a pathogen specifically related to colon cancer [8]. Bacteremia and infectious endocarditis from S. bovis may be related to the presence of neoplastic lesions in the large intestine and hepatic disease [9]. The incidence of the association of colonic neoplasia with S. bovis has been estimated to be 18% to 62% [9]. This is because the underlying disease may promote the overgrowth of S. bovis
and its translocation from the intestinal lumen into portal venous or lymphatic system [10]. As a result, many studies in the literature have stressed the need for investigation of colonic lesions among patients, especially elderly ones, who have bacteremia and/or endocarditis from *S. bovis*. Comprehensive diagnostic assessments, such as stool occult test, tumor markers, or colonoscopy, should be performed to rule out an occult colon or even extracolon cancer during the treatment of infective endocarditis. Physicians should avoid only focusing on the infectious disease. Endocarditis caused by other streptococci like *S. faecalis* and *S. equines* and the bacteremia introduced by *S. sanguis*, *S. equinus* and *S. salivaris* have also been found to be associated with colonic neoplasias [9].

The case we presented serves as an example that early detection provides curative treatment of colon cancer with a suspicious mind about the correlation between *S. bovis* endocarditis and colon cancer. In conclusion, screening tests must be arranged for patients with *S. bovis* bacteremia for the highly suspicious colon lesion, especially in the elderly patients with underlying spondylosis.

References

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牛鏈球菌在一位大腸癌病人引起的感染性脊椎間盤炎及心內膜炎

王政為 簡裕明 楊榮森

摘 要

骨骼肌肉系統不適是病患常見的問題，尤其在老年病患; 類似症狀亦會發生在患有感染性心內膜炎的病人中，卻常被當成風溼性或退化性關節炎來處理，其中少數可能會合併有感染性脊椎炎，尤其是練球菌類感染性心內膜炎；若是由牛鍊球菌引起之菌血症或感染性心內膜炎，則需注意是否有合併結腸病灶；本研究報告一位 64 歲老年男性，因運動性呼吸困難，進一步診斷為牛鍊球菌菌血症併感染性心內膜炎，雖無腸道症狀，安排大腸鏡檢後發現盲腸有初期大腸癌病灶，並接受右結腸部分切除，診治期間亦併發嚴重下背痛，經核磁共振檢查發現第四、五腰椎脊椎間盤炎，接受清創併骨移植手術，在合併使用抗生素控制感染之下，術後恢復狀況良好，沒有再出現症狀。對於患有牛鍊球菌菌血症或感染性心內膜炎之病患，應警覺是否併有結腸病灶，而病患之骨骼肌肉系統不適，亦應小心評估是否有感染之虞。

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關鍵詞：脊椎間盤炎、心內膜炎、牛鍊球菌、大腸癌