Imaging Analysis of Ankylosing Spondylitis

SHAO Xiaoli

Matang Traditional Chinese Medicine Hospital of Xianning, Xianning Hubei 437100, China

***Corresponding Author:** SHAO Xiaoli*

Abstract: Objective: to explore and analyze the value of imaging examination in the diagnosis of ankylosing spondylitis. Methods: 10 cases of ankylosing spondylitis treated in our hospital from July 2021 to March 2022 were selected as sample cases. All patients underwent imaging examination, and the final results of imaging examination and diagnosis were compared. Results: by comparing the imaging results with the final diagnosis results, it was found that there was no significant difference between the imaging results and the final diagnosis results (P＞0.05), which indicated that the imaging examination was feasible. Conclusion: in the diagnosis of ankylosing spondylitis, the use of imaging examination can improve the diagnostic efficiency and provide reliable data for the future treatment of ankylosing spondylitis, which is worthy of clinical attention and promotion.

Keywords: *imaging examination; ankylosing spondylitis; diagnostic effect*

DOI: 10.33142/cmn.v1i1.7660

Introduction

Ankylosing spondylitis is a disease characterized by inflammation of sacroiliac joints and spinal attachment points. It is an autoimmune chronic inflammatory disease, which is related to many factors such as heredity, immunity, environment and trauma. Hereditarily, it is confirmed that the gene related to ankylosing spondylitis is HLA-B27, and patients are often screened clinically. For patients with ankylosing spondylitis, 90% of patients have positive genes. Infection is mainly related to the pathogenesis of ankylosing spondylitis, such as Klebsiella pneumoniae. As well as other factors such as trauma environment. Ankylosing spondylitis is mainly caused by young men clinically. The main symptoms are pain in lumbosacral and lumbosacral parts, swelling and pain of unilateral joints of major joints of limbs and pain in heel of Achilles tendon. Fibrosis and ossification of the annulus fibrosus of intervertebral disc and the adjacent connective tissue are its pathological features, which are also the main reasons for the stiffness and rigidity of the spine in patients with ankylosing spondylitis and the unfavorable movement. Ankylosing spondylitis is a kind of seronegative spondyloarthropathy, which includes psoriatic arthritis, reactive arthritis and so on. Clinically, it is necessary for patients to make corresponding diagnosis and treatment in specialist clinics [1-2].

1 Materials and Methods

1.1 General information

The sample cases were 10 patients with ankylosing spondylitis who were treated in our hospital from July 2021 to March 2022. The age was 21-42 years old, with an average age of 32.85 ± 1.63 years old. The general data of ankylosing spondylitis patients were comparable (p＞0.05).

1.2 Methods

All patients were examined by imaging (nuclear magnetic resonance, CT and X-ray) and pathological examination.

1.3 Observation index

Compare the imaging results of patients with the final diagnosis results [3-4].

2 Results

Comparison of diagnostic accuracy

By comparing the results of imaging examination and pathological examination, there is no significant difference (P＞0.05), and the difference is not statistically significant, as shown in Table 1.

Table 1 Comparison of diagnostic accuracy of patients (%)

Group	Number of cases	Diagnosed as ankylosing spondylitis	Accuracy rate
Diagnosed results	10	10	10(100.00)
Imaging examination results	10	9	9(90.00)
χ^2			1.0526
P			0.3049

3 Discussion

Ankylosing spondylitis is an immune disease that occurs in young and middle-aged men. It is a chronic inflammatory disease and belongs to the category of

rheumatology immunology. Its main manifestation is inflammation of sacroiliac joints, spine and peripheral joints, which will lead to bony fusion. In China, the incidence of ankylosing spondylitis is 0.25%-0.5%. For example, there can be one ankylosing spondylitis patient in 200 people, and the ratio of male to female is about 4:1. The incidence of male is much higher than that of female. In addition, the onset of women is relatively slow, and the condition is relatively mild. The onset age is usually 13-31 years old, and the peak age of onset is 20-30 years old. Incidence before 8 years old and after 40 years old is relatively rare. Therefore, ankylosing spondylitis is a kind of rheumatology and immunology disease with low incidence, but great influence on people's future life and quality of life. Harm of ankylosing spondylitis: 1 Ankylosing spondylitis will have some clinical symptoms, which will cause the pain of sacroiliac joint, lumbago and back of spine, pain and swelling of peripheral joint, heel pain, vision damage outside the joint, occasional heart involvement, lung involvement, kidney involvement and nervous system involvement, and the existence of these clinical symptoms will affect the patient's normal life, work and quality of life. 2 The long-term existence of ankylosing spondylitis can cause: 1 The rigidity of the spine affects the patient's long-term mobility. 2 It may affect one joint, that is, the hip joint, and the involvement of the hip joint. Although this is not a very high proportion, it may account for about 16%, but it will eventually lead to femoral head necrosis. 3 Long-term ankylosing spondylitis even causes vertebral fracture, which affects the spinal cord. Therefore, ankylosing spondylitis is not particularly serious in most cases, but it also needs to be given enough attention. At present, the cause of ankylosing spondylitis is not particularly clear, but up to now, in fact, many studies have shown that the disease is related to many factors, the first is genetic factors, the second is environmental factors, and the third is immunological abnormalities. Genetic factors still play an important role in the pathogenesis of ankylosing spondylitis. In fact, many people know that there is such a gene as HLA-B27, which is related to the pathogenesis of ankylosing spondylitis. It was found that the positive rate of HLA-B27 was 10%-20% among the first-degree relatives of the patient, that is, his parents and children, and the risk of the disease was 20-40 times higher than that of the general population. Specific studies have found that HLA-B2704, B2705 and B2702 subtypes are related to the onset of this disease. Among the external environmental factors, two infections, Klebsiella pneumoniae infection and chlamydia infection in intestinal tract and urinary system, are found to be related to the onset of ankylosing spondylitis, which is one of its inducing reasons. Third, there are some immunological abnormalities in patients with ankylosing spondylitis, including serum immunoglobulin, circulating immune complex, interleukin-6 and interleukin-10, etc. Therefore, the onset of ankylosing spondylitis is a disease induced by many factors [1-4]. Ankylosing spondylitis is a kind of rheumatism, or autoimmune disease, which is common in young men. The symptoms of ankylosing spondylitis can be summarized into three aspects: 1 First of all, young boys are prone to illness, and the other main symptom is recurrent back pain. Often, some patients complain that they may have obvious back pain at night, and even wake up with pain. It's hard to turn over in the morning, and their neck activity is limited, which is called morning stiffness. 2 Patients with ankylosing spondylitis will have swelling and pain of peripheral joints, such as ankles, knee joints, and even sternoclavicular joints of upper limbs. 3 Patients with ankylosing spondylitis will also have some extra-articular manifestations, such as sudden redness of eyes and poor eyesight, which is called iridocyclitis. Hematuria in the kidney, combined with IGA nephropathy, may cause some unexplained diarrhea in the intestinal tract, and the symptoms of diarrhea may appear for a long time. Even some patients may have some symptoms such as aortic valve insufficiency, pulmonary fibrosis and so on. Therefore, ankylosing spondylitis should pay attention to the performance outside the joints besides lumbago and joint pain. The diagnosis of ankylosing spondylitis has the following points: 1 Clinical manifestations: Ankylosing spondylitis can be suspected when the patient has back stiffness, heel pain, and pain at some muscle attachment points. Because ankylosing spondylitis is not a bone change, but a muscle attachment point, that is, inflammation occurs when muscles attach to joints, which leads to the above symptoms. Many patients have heel pain, especially walking pain, and back stiffness, which causes pain when pressing sacroiliac joints. Some patients with younger onset age, such as 15-18 years old, have leg pain and aggravated hip pain at the earliest stage of activity, and get a little better after rest, but sometimes the longer the pain, the worse the situation, which is often misdiagnosed as growth pain clinically, and has not attracted attention; 2 Laboratory examination: Genetic examination. Patients with HLA-B27 positive are more likely to suffer from ankylosing spondylitis than patients with HLA-B27 negative, and the risk may be 3-4 times or higher. In addition, the examination of inflammatory indicators such as ESR and C-reactive protein, as well as X-ray, CT and nuclear magnetic resonance examination, can detect lesions and make early diagnosis. Early medication can control the development of the disease, so that the disease can be alleviated. Ankylosing spondylitis is generally treated in a conservative way, thus delaying the development of the disease and improving clinical symptoms. If the joint productionSerious impact, which can be treated by surgery. Ankylosing spondylitis is a common chronic inflammatory disease in clinic, which belongs to the treatment scope of Rheumatology and Immunology. Usually, the main pathological parts of ankylosing spondylitis are sacroiliac joints, spine and peripheral joints, and the symptoms are not too severe at

first. With the development of the disease, patients may have spinal deformity, spinal rigidity and hip rigidity, which seriously affect their lives. Taking conservative treatment first can effectively relieve clinical symptoms, and you can also take some drugs, such as nonsteroidal anti-inflammatory drugs, such as ibuprofen, to effectively relieve clinical pain. If the joint is severely deformed and its activity is restricted, artificial joint replacement can be adopted to improve life treatment.

Ankylosing spondylitis is a rheumatic disease, and the average incubation period is 6 years from its onset to clinical diagnosis. This intermediate patient may have various discomfort and joint lesions, but in fact, it often invades some large axial joints, such as hip joint and sacroiliac joint. Ultrasound is also very advantageous in examining the hip joint, because the early joint lesion of ankylosing spondylitis is a tendon terminal disease. In addition, the changes of synovium, the diagnosis and examination of the end of tendon by ultrasound are very clear, and it is also very sensitive to synovium and joint effusion. In clinic, sometimes it has been painful for 2-3 years and has been treated as lumbar disc herniation, or simply as the treatment of hip synovitis. After ultrasonic diagnosis, ankylosing spondylitis still has some characteristics. For example, unlike transient synovitis or simple synovitis, ankylosing spondylitis has no change to the end of bones and tendons. Ankylosing spondylitis often thickens at the end of tendons during hip joint examination, especially at the attachment end of femoral head. Tendon thickening will lead to a false deformation of femoral head. At this time, basically, he will be prompted to do further clinical tests, because the diagnosis of ankylosing spondylitis is not based on a certain imaging, but a comprehensive evaluation, including clinical symptoms, laboratory indicators and other imaging data. Ultrasound can give him some early tips to avoid misdiagnosis. For ankylosing spondylitis, imaging examination is an important basis for diagnosis and staging. There are common X-ray examination, CT examination, magnetic resonance examination and musculoskeletal ultrasound examination, which are as follows: 1. X-ray examination: One of the most commonly used examination methods, which mainly takes the anteroposterior and anteroposterior radiographs of sacroiliac joints and lumbar vertebrae. Sometimes, it is necessary to take extraarticular radiographs of hips, knees and shoulder joints to supplement the diagnosis. But the sensitivity of X-ray examination is low, which is not conducive to early diagnosis. Generally speaking, if the imaging abnormality occurs, it will come to the middle and late stage. X-ray manifestations mainly include the following aspects: sacroiliac joint: 98%-100% of cases have changes of sacroiliac joint under X-ray in the early stage, which can be divided into five grades. Grade 0 is normal sacroiliac joint, while Grade I shows osteoporosis, widened joint space, suspicious bone erosion and blurred joint surface. Grade Ⅱ showed slight destruction of articular surface, blurred joint edge, slight sclerosis, and cystic degeneration. Grade Ⅲ is the manifestation of joint destruction and reconstruction, with obvious narrowing of joint space, blurred edges, definite cystic degeneration, hardening of both sides of the joint and increased density. Grade Ⅳ is mainly sclerosis, joint clearance disappears, joint fusion or ankylosis; Spine: The early stage is characterized by general osteoporosis, and the lumbar spine straightens due to the small curvature of normal lordosis. In severe cases, vertebral compression fractures may occur. In the later stage, the vertebral body becomes square, the bone bridge is formed, and the spine shows characteristic bamboo-like changes. Around the joint: the gap between the hip and shoulder joint is narrowed, and new bones attached with ligaments can be formed, including metatarsal osteophyte and periostitis at the attachment of Achilles tendon [5-7]; 2 CT examination: CT examination is much more sensitive than X-ray examination, and the shooting position is consistent with that of X-ray examination. CT imaging findings of ankylosing spondylitis mainly focus on sacroiliac joints: the first grade is suspected or extremely slight sacroiliitis. The second grade is mild sacroiliitis, with blurred joint edges, hardening of the area near the joint and slight narrowing of the joint space. The third grade is moderate sacroiliitis, with obvious blurring of joint edges, hardening of proximal joints, narrowing of joint space and obvious bone destruction. Grade 4 sacroiliac joint fusion or complete rigidity, with or without sclerosis. If the patient's imaging conforms to sacroiliitis, unilateral grade 3 to 4 or bilateral grade 2 to 4, and meets more than one clinical standard, it can be diagnosed as ankylosing spondylitis. 3 Magnetic resonance examination: the most sensitive and sensitive examination method at present. Arthritis of axial spondyloarthropathy is also a major diagnostic basis. The main manifestations are edema on the joint surface, synovial hyperplasia, and even bone invasion and destruction, which can be shown in the early stage. It is also an important basis for future treatment to observe curative effect. On the MRI, bone marrow edema can be seen in the sacrum or ilium of the patient's sacroiliac joint, that is, whitening and signal enhancement can be seen on T2 image [8-9]. There will be effusion between sacroiliac joints, that is, there will be brightness, whitening and signal enhancement on T2 image and T2 fat image of nuclear magnetic resonance, which is the earliest manifestation of sacroiliitis of ankylosing spondylitis. There will be further bone calcification, that is, ligament calcification. At this time, osteophyte formation can be seen. 4 Musculoskeletal ultrasound examination: It is mainly aimed at joints outside joints, and the effect is sensitive. It can be manifested as edema of joints, edema of tendon and muscle attachment points, and synovial hyperplasia, which are the main manifestations. Bone ultrasound examination is mainly used for the examination of peripheral joints and extra-articular soft tissues, including tendons, myofascias

and synovitis. Under the guidance of ultrasound, it can also be used to observe deep tissues such as hip joints, especially joints with rich blood flow [10]. Imaging examination has just talked about four aspects, among which magnetic resonance examination is sensitive. If ankylosing spondylitis is suspected, it should be examined with magnetic resonance as early as possible. In this study, 10 patients with ankylosing spondylitis were examined by imaging, and the diagnostic accuracy was high, which was consistent with the final diagnosis result.

To sum up, taking imaging examination and diagnosis for patients with ankylosing spondylitis in clinic can effectively judge the condition and provide basis for follow-up treatment, which is worth popularizing.

References

[1] Hu Y, 2021. The efficacy of low-field MRI combined with radiographic examination in the diagnosis of sacroiliac joint lesions in patients with early ankylosing spondylitis and its influence on bone metabolism indexes. China Medical Innovation, 18(31):129-133.

[2] Huang J C, Qian B P, Qiu Y, et al., 2021. Imaging features and surgical results of ankylosing spondylitis complicated with atlantoaxial dislocation. Chinese Journal of Spine and Spinal Cord, 31(4):294-301.

[3] Zhang L S, 2021. The effect of multimodal imaging examination in the diagnosis of sacroiliac joint diseases in early ankylosing spondylitis. Imaging Technology, 33(2): 11-14.

[4] Li W C, 2020. Analysis of CT and MRI imaging features of ankylosing spondylitis in active stage. China Clinical New Medicine, 13(6):614-617.

[5] Huang S H, He D F, Chen H B, 2020. Retrospective imaging analysis of 30 patients with cervical spine fracture due to ankylosing spondylitis. China Journal of CT and MRI, 18(5): 136-138.

[6] Feng B, Ma H H, Wang L Q, et al., 2018. Clinical and imaging features of rheumatoid arthritis with ankylosing spondylitis. Journal of Qingdao University (Medical Edition), 54(4): 468-471.

[7] Qiao M, Wu X T, Qian B P, et al., 2018. Progress in formation mechanism, imaging manifestation and treatment strategy of pseudarthrosis of ankylosing spondylitis. Chinese Journal of Spine and Spinal Cord, 28(3):275-278.

[8] Chen J, 2018. Nursing care of imaging diagnosis of ankylosing spondylitis. Electronic Journal of Practical Clinical Nursing, 3(4):12-13.

[9] Liu H, Qian B P, Qiu Y, et al., 2015. Natural history of imaging of ankylosing spondylitis and its clinical significance. Chinese Journal of Spine and Spinal Cord, 25(9):856-860.

[10] Xie J M, Zhao C , 2015. Correlation analysis between serum Dkk-1 level and bone imaging changes in patients with ankylosing spondylitis. Rheumatology and Arthritis, 4(5): 13-17.