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Article

The Clinical Application of Magnetic Resonance Imaging and Double Spiral Computed Tomography in the Diagnosis of Bone Tumor

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Abstract: The purpose of the study was to observe the diagnostic effect and clinical application value of magnetic resonance imaging (MRI) and double spiral computed tomography (CT) in tumor diagnosis. A total of 68 patients with genu bone tumor were selected, including 48 patients in group A and 56 patients in group B. The 36 patients in group C, who received combined treatment. After comparison of the clinical diagnosis results of the three detection methods, it was found that the detection rate of knee bone tumor was 72.92% in group A and 83.93% in group B, with no statistically significant difference (P>0.05). The detection rate of tumor lesions in group C was 97.22%, significantly higher than that in group A and B. The detection rate of patients in group A, B and C showed an increasing trend, and the difference between group C and Group A and B was significant (P<0.05). Therefore, MRI and double spiral CT had similar detection rates in the diagnosis of knee bone tumors, but double spiral CT can better display the lesion scope and the fine structure of bone tumors. MRI detection had obvious advantages in the diagnosis of the range of bone tumors, such as soft tissue masses and bone marrow edema.

Keywords: Magnetic resonance imaging; Double spiral computed tomography; The joint detection

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1. Introduction

Bone tumors are those that occur in bone or its adjacent tissues. Malignant bone tumors develop rapidly with poor prognosis and high mortality [1]. Relevant studies have shown that the incidence of bone tumors is 2%~3% of the incidence of systemic tumors, and it is on the rise [2]. Malignant bone tumors are divided into primary and secondary [3]. Metastases from other tissues or organs in the body to bone through the blood circulation and lymphatic system are secondary malignant bone tumors. There is also a type of lesion known as tumor-like lesions [4]. The tissue of tumor-like lesions does not have the characteristics of tumor cell morphology, but its ecology and behavior are destructive to the tumor. This kind of tumor is difficult to diagnose commonly, which influence health safety of patient [5]. At present, there are many methods for early clinical diagnosis of bone tumor, among which the most widely used is the traditional ultrasonic diagnosis method. Although this method has been used for a long time in clinical practice and has been recognized by patients and clinical practitioners, with the passage of time and the continuous improvement of the level of medical devices, the diagnostic level of science and technology in China has also been improved accordingly [6]. Relevant studies have shown that MRI and double spiral CT have gradually attracted more and more attention in the clinical diagnosis of bone tumors [7-8]. MRI has many advantages, such as small radiation damage, high soft tissue density

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resolution, direct use of tomographic imaging, imaging parameters and corresponding methods [9]. MRI can be directly cross-sectional, coronal, sagittal and oblique imaging, and the image quality is high. It is conducive to the display of tumor range and source [10]. However, it still has disadvantages such as inability to show calcification or ossification lesions, long scanning time and low efficiency [11]. CT can clearly show the calcification or ossification lesion of bone tumor, and the scanning time is relatively short, without interference of motion artifact [12]. The price of CT is relatively low and can be accepted by more patients. For tumor patients, the more important step is to determine whether there is a lesion, the nature of the lesion is benign or malignant, malignant tumor is early, middle or late [13]. In this process, CT will basically play an important role. However, CT images are not as clear as MRI images, the resolution of soft tissue density is not high, imaging parameters are few, and the obtained information is insufficient [14]. In order to further observe and compare the clinical application effect and value of double spiral CT and MRI in the diagnosis of knee bone tumors, double spiral CT scanning of knee bone tumor lesions and magnetic resonance imaging were used to complete the test.

2. Materials and Methods

2.1 Materials

This experiment choice between January 2019 and April 2020 in our hospital for treatment of 68 cases of patients with knee bone tumor detection as the research object (above all patients after biopsy pathological examination or intraoperative pathologic diagnosis of knee bone tumors), including osteosarcoma (40 cases), fibrosarcoma (11 cases) and chondrosarcoma fibrosarcoma (11 cases), and the giant cell tumors (17 cases). There were 45 cases of tumors in the upper tibia segment and 23 cases of tumors in the lower femur segment. The patients were divided into 37 females and 31 males, with an average age of (39.6±10.4) years. Among them, 48 cases underwent double helical CT scan as group A, 56 cases underwent magnetic resonance imaging as group B, and 36 cases underwent CT combined with MRI as group C. There was no significant difference in basic parameters between the two groups (P> 0.05).

2.2 Methods

In group A, bone tumor lesions in the knee were scanned by double spiral CT (gelightspeed16-row spiral CT machine, 1.35.240 mA, 1 cm). In group B, bone tumor lesions in the knee were tested by MRI (Geexcitatory 1.5 t superconducting MRI, with loss control, axial scanning, layer thickness and spacing of 0.3cm). Postoperative pathological examination was performed in all 68 patients. MRI and CT images were analyzed and compared to discuss in depth the lesion site, lesion scope, calcification rate and tumor nature of genu bone tumor.

2.3 Statistical Tests

SPSS20.0 statistical software was used for data sorting and analysis. The measurement data were expressed as (Mean ±S E), and T-test was used. Enumeration data were expressed as a percentage (%), and comparison between the two groups was made by χ^2 test. P<0.05 indicated that the difference was statistically significant.

3. Results and Discussion

The coincidence rate between the two detection methods and pathological examination results was 72.92% in group A and 83.93% in group B, with no statistically significant difference (P>0.05), as shown in Table 1. The detection rate of tumor lesions in group C was 97.22%, significantly higher than that in group A and B. As shown in Table 2, the detection rate of patients in group A, B and C showed an increasing trend, and the difference between group C and group B was significant. There were statistically significant differences between groups A and B (P<0.05).

Table 1. The comparison of the coincidence rate of different detection methods and pathological examination results (n,%)

Group	Case number	Detected	Non-detected	Detection rate
Group A	48	35	13	72.92
Group B	56	47	9	83.93
$\chi 2$				1.8791
P				>0.05

Table 2. The detection rates of the combined test, CT and MRI (n,%)

Group	Case number	Detected	Non-detected	Detection rate
Group A	48	35	13	72.92
Group B	56	47	9	83.93
Group C	36	35	2	97.22
P				<0.05
P				<0.05

Notes: Comparison of Group A and Group B: χ^2=9.000, P<0.05, Comparison of Group B and Group C: χ^2=3.9973, P<0.05.

According to the above results, the detection rate of

bone tumor in the double spiral CT test (group A) was 72.92%, while that in the MRI technique (group B) was 83.93%, and there was no statistical difference between CT and MRI (P>0.05). The detection rate of tumor lesions in 36 patients (group C) was 97.22%, significantly higher than that in group A and B. The incidence of patients in group A, B and C was on the rise, indicating that CT combined with MRI can effectively improve the detection rate of tumor, which is of great significance for the diagnosis of knee bone tumor. The conclusion was basically consistent with the research results of Zhang et al [15].

4. Conclusion

In conclusion, the use of double spiral CT and MRI in the diagnosis of knee bone tumors was similar to the results, but double spiral CT could better display the lesion scope and the fine structure of bone tumors. MRI detection has obvious advantages in the diagnosis range of bone tumor soft tissue mass, bone marrow edema, etc.

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