ARCHIVES OF HELLENIC MEDICINE: ISSN 11-05-3992

SHORT COMMUNICATION
ΒΡΑΧΕΙΑ ΔΗΜΟΣΙΕΥΣΗ

ARCHIVES OF HELLENIC MEDICINE 2022, 39(3):410–411
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2022, 39(3):410–411

The place of radiotherapy in the treatment of pigmented villonodular synovitis

Y.B. Cihan

Department of Radiation Oncology, Kayseri City Education and Research Hospital, Kayseri, Turkey

Θέση της ακτινοθεραπείας στη μελαγχρωματική λαχνοοζώδη υμενίτιδα

Περίληψη στο τέλος του άρθρου

Key words: Pigmented villonodular synovitis, Radiotherapy, Treatment

Pigmented villonodular synovitis (PVNS) is a rare, benign, but locally aggressive tumor, characterized by synovial cells in the tendon layers and joint capsules. It is a disease of middle-age, of insidious onset, progressive, and it usually involves a single joint. The knee joint is involved in 3/4 of the cases, followed by the joints of the hip, ankle, shoulder and elbow. Plain X-ray and magnetic resonance imaging (MRI) are used for diagnosis, and the histopathological examination is accepted as the gold standard for definitive diagnosis.[1–4] Two forms of the disease have been defined, localized and diffuse, of which the diffuse type is most often seen. The two forms are histologically similar, but show great differences in their biological behavior, and therefore in the treatment principles and prognosis.[1]

There is no standardized treatment for the rare occurrence of PVNS. Conservative and surgical methods are used, depending on the degree of joint damage and the age of the patient. Conservative treatment is primarily physiotherapy, which increases the range of motion of the joint, along with medication, including analgesic and anti-inflammatory support. Surgical treatment consists of excision of solitary lesions. In diffuse lesions, synoviectomy, arthroplasty and arthrodesis are the treatment options.[2–6] Surgical resection of the lesion is accepted as the preferred treatment, but postoperative recurrence may be a problem, with the reported recurrence rate ranging from 8% to 55%.[2,3] Richter and colleagues reported that arthroscopic, open and arthroscopic mini-open synovectomy all had high recurrence rates, of 58% (69/118), 36% (35/97), and 50% (5/10), respectively.[5] Radiotherapy and radioisotope surgery may be applied to reduce recurrences after synovectomy.

Radiation therapy (RT) has emerged as an additional treatment for PVNS in recent years. The value of external beam RT in the interdisciplinary management of PVNS has been proven by a comprehensive literature review of the clinical use of RT and the results of the 2008–2009 German Cooperative Group on Radiotherapy in Benign Diseases (GCG-BD).[7] In addition, a large number of reports have confirmed that the use of postoperative external RT can further reduce the recurrence rate.[4,6–9] Heyd and colleagues evaluated all previously reported treatments, RT indications and techniques, the local control rate, possible functional outcome and use of external beam RT in patients with PVNS. The primary treatment approach was cytoreductive surgery in all cases. In the case of incomplete resection, residual tissue or extensive local recurrence, 39 cases (95.1%) were treated with RT, in 34 of which (82.9%) excellent or good functional results were recorded. RT use did not show early or late toxicity greater than RTOG grade II. After 1–250 monthly follow-up periods, and total doses applied at 16–50 Gy interval, the overall control rate was 84.5%. In conclusion, the literature review indicated that RT is a safe and effective treatment option for preventing disease progression or recurrence after primary surgery for PVNS.[7] Park and colleagues reported that the effect of low dose (over 20 Gy) RT is similar to that of moderate dose (approximately 35 Gy).[6] Capellen and colleagues followed for the median duration of 71 months (range 13–238 months) a consecutive series of 105 cases of open

Submitted 24.5.2021
Accepted 19.6.2021

surgery. The most common histopathology was the diffuse type, found in 66 cases (54%). In 22 (18%) cases the lesions recurred, >90% in the first 3 years, with a median of 18 months. Of these 22 recurrences, 9 (11%) had primary disease and 13 (34%) had recurrence. According to the number of follow-up patients, the rate was 5.8%. As a result, they pointed out that external RT in diffuse type PVNS is the treatment option for patients with non-operable and recurrent disease,[8] although the toxic potential, such as secondary malignancy and joint contractures, makes it a questionable option for younger patients. Mazonakis and colleagues examined PVNS in the knee and hip joints with the Monte Carlo methodology for risk of cancer caused by RT. The organ-specific cancer risks from knee irradiation for PVNS were found to be insignificant, but with RT in the hip joint, the risk of bladder and colon cancer may increase slightly, which should not be ignored during treatment planning and follow-up.[10]

In conclusion, the initial treatment of pigmented PVNS is arthroscopic or open total synoviectomy. RT is usually used as an adjunct to surgical synovectomy in recurrent relapses. Postoperative RT is a very safe and effective treatment option to prevent disease progression or recurrence, especially in diffuse PVNS. Although successful results have been reported with RT, long-term results are not yet available. There is a need for a wider range of investigations to identify this disease and to clarify the place of RT in its treatment, with further investigation of its efficacy and toxicity.

ΠΕΡΙΛΗΨΗ

Θέση της ακτινοθεραπείας στη μελαγχρωματική λαχνοοζώδη υμενίτιδα

Y.B. CIHAN

Kayseri City Education and Research Hospital, Department of Radiation Oncology, Kayseri, Τουρκία

Αρχεία Ελληνικής Ιατρικής 2022, 39(3):410–411

Η μελαγχρωματική λαχνοοζώδης υμενίτιδα είναι ένας σπάνιος, καλοήθης, αλλά τοπικά επιθετικός όγκος των κυττάρων του τένοντα και του αρθρικού υμένα. Η προτιμότερη θεραπεία είναι η χειρουργική αφαίρεση. Η ακτινοθεραπεία συνήθως χρησιμοποιείται συμπληρωματικά στη χειρουργική υμενεκτομή σε υποτροπή ή επιδείνωση. Αν και έχουν αναφερθεί επιτυχή αποτελέσματα της ακτινοθεραπείας, εν τούτοις δεν έχουν ακόμη αποσαφηνιστεί τα μακροχρόνια αποτελέσματά της.

Λέξεις ευρετηρίου: Ακτινοθεραπεία, Θεραπεία, Μελαγχρωματική λαχνοοζώδης υμενίτιδα

References

1. GRANOWITZ SP, D'ANTONIO J, MANKIN HL. The pathogenesis and long-term end results of pigmented villonodular synovitis. *Clin Orthop Relat Res* 1976, 114:335–351
2. OGILVIE-HARRIS DJ, McLEAN J, ZARNETT ME. Pigmented villonodular synovitis of the knee. The results of total arthroscopic synovectomy, partial, arthroscopic synovectomy, and arthroscopic local excision. *J Bone Joint Surg Am* 1992, 74:119–123
3. ZVIJAC JE, LAU AC, HECHTMAN KS, URIBE JW, TJIN-A-TSOI EW. Arthroscopic treatment of pigmented villonodular synovitis of the knee. *Arthroscopy* 1999, 15:613–617
4. HOROSCHAK M, TRAN PT, BACHIREDDY P, WEST RB, MOHLER D, BEAULIEU CF ET AL. External beam radiation therapy enhances local control in pigmented villonodular synovitis. *Int J Radiat Oncol Biol Phys* 2009, 75:183–187
5. RICHTER M, TRZECIAK T, OWECKI M, PUCHER A, KACZMARCZYK J. The role of adipocytokines in the pathogenesis of knee joint osteoarthritis. *Int Orthop* 2015, 39:1211–1217
6. PARK G, KIM YS, KIM JH, LEE SW, SONG SY, CHOI EK ET AL. Low-dose external beam radiotherapy as a postoperative treatment for patients with diffuse pigmented villonodular synovitis of the knee: 4 recurrences in 23 patients followed for mean 9 years. *Acta Orthop* 2012, 83:256–260
7. HEYD R, SEEGENSCHMIEDT MH, MICKE O. The role of external beam radiation therapy in the adjuvant treatment of pigmented villonodular synovitis. *Z Orthop Unfall* 2011, 149:677–682
8. CAPELLEN CF, TILING R, KLEIN A, BAUR-MELNYK A, KNÖSEL T, BIRKENMAIER C ET AL. Lowering the recurrence rate in pigmented villonodular synovitis: A series of 120 resections. *Rheumatology (Oxford)* 2018, 57:1448–1452
9. STEPHAN SR, SHALLOP B, LACKMAN R, KIM TWB, MULCAHEY MK. Pigmented villonodular synovitis: A comprehensive review and proposed treatment algorithm. *JBJS Rev* 2016, 4:01874474-201607000-00005
10. MAZONAKIS M, TZEDAKIS A, LYRARAKI E, DAMILAKIS J. Organ-specific radiation-induced cancer risk estimates due to radiotherapy for benign pigmented villonodular synovitis. *Phys Med Biol* 2016, 61:6400–6412

Corresponding author:

Y.B. Cihan, Kayseri City Education and Research Hospital, Şeker District, Muhsinyazıcıoğlu Boulevard, no 77, 38080 Kocasinan/Kayseri, Turkey
e-mail: cihany@erciyes.edu.tr