



Chiropractic pain control in myelofibrosis: A case report

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ABSTRACT

Background: Myelofibrosis (MF) is a rare hematological disease. Currently available therapies mainly offer symptom control with limited curative benefits.

Case presentation: A 58-year-old man old man presented with MF for several years and had undergone splenectomy and targeted therapy with ruxolitinib. During the last 3 years of his life, he suffered from intractable bone pain that was resistant to medical, analgesic and physical therapies. However, significant pain alleviation was achieved shortly after starting chiropractic treatment. Patient's condition continued to deteriorate and he died of septic complications.

Conclusions: Bone and joint pain is the common symptom of cancer. This report highlights the potential benefits of integrating chiropractic into a multidisciplinary approach to cancer care. In rare diseases like myelofibrosis, the main limitation of this report was the lack of the related references for comparative analysis. Further studies regarding the efficacy of chiropractic therapy in controlling various cancer pains are needed to guide decision making.

Introduction

Myelofibrosis (MF) is a rare haematologic neoplasm characterized by progressive marrow fibrosis, pancytopenia and extramedullary haematopoiesis. The yearly calculated incidence of MF in the European Union ranged from 0.1 to 1.0 per 100,000 people [1]. Diagnosis can be established by bone marrow examination. Currently, available therapies mainly offer symptom control with limited curative benefits or the ability to alter disease progression. Although haematopoietic stem cell transplantation is potentially curative, it is associated with significant morbidity and relapse rate [2]. The literature regarding treatment of intractable bone pain in MF patients is sparse.

Case presentation

A 58-year-old man was referred to our clinic for chiropractic care in March 2013 with a diagnosis of myelofibrosis since 2009. His clinical features were quite insidious and ambiguous, beginning with fatigue, mild fever and vague back pain for a period of time. He worked as a civil engineer and required walk-through inspections of the workplace. In 2009, the patient presented on orthopedic assessment because of accelerating pains in the neck and back but the only findings were mild splenomegaly and colonic polyps. He underwent surgical removal of the polyps and was treated with acetaminophen and physiotherapy for back

pain. Subsequent a bone marrow examination was performed which showed reduced erythropoiesis with normoblastic maturation, marked hyperplastic granulopoiesis with focal left-shift and no increase in blasts, moderately increased megakaryocytes with some hyperchromatic ones seen, and reticulin fibres were diffusely coarsened which confirmed the diagnosis of primary myelofibrosis (Fig. 1). He was initially put on observation as he relatively asymptomatic. Over the next three years, he became increasing lethargic with poor appetite. He also had progressive abdominal discomfort and accelerated back pain. Images revealed marked splenomegaly (long axis: > 20 cm) but no evidence of lymphadenopathy. Treatment with oral ruxolitinib (a JAK inhibitor) was started with improvement of his debilitating symptoms. Acetaminophen and tramadol had been used for his pain treatment with mild improvement. Acupuncture had been tried but did not give significant and lasting effect in his back pain.

The patient sought chiropractic treatment for pain relief in 2013. He characterized his neck pain as being dull (6–8/10 on pain scale) and radiated into his left upper arm, and his back pain as widespread. Physical examination yielded painful cervical paraspinal and lumbar musculature with hypertonicity and restricted range of motion. His x-rays demonstrated a reversed cervical lordosis, lumbar hyperlordosis and moderate osteopetrosis and osteophytes in the vertebrae. Chiropractic treatment aimed to reduce hypertonicity, restore the spinal mobility and proprioceptive function, including spinal

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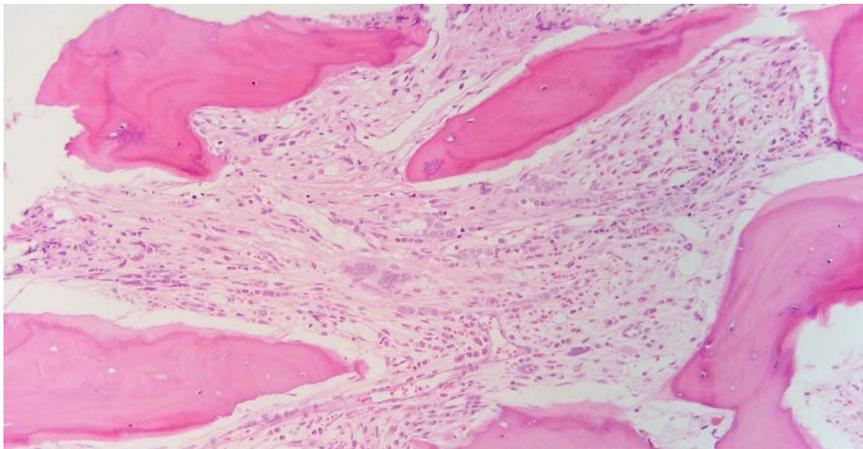


Fig. 1. Primary myelofibrosis, H & E stain of bone marrow biopsy.

mobilization and stretching exercise. The initial (3-month) results of chiropractic provided 3-times-weekly were notable. The patient reported his pain as 2/10 on pain scale and a significant improvement of fatigue. He had reduced his daily reliance on analgesics and returned to work at his building construction sites. The second phase of chiropractic treatment performed twice-weekly for another 3 months achieved an improved spinal mobility, reduced paraspinal muscles tenderness and stopping of pain relievers. Subsequently the patient had received maintenance therapy to enjoy a feeling of well-being in the following 15 months.

In January 2015, his condition deteriorated and the spleen size was 30 cm on ultrasound examination. The patient underwent splenectomy for progressive disease. After the surgery, he came intermittently for chiropractic therapy because his pain had returned with increased intensity. He described that the chiropractic was helpful for him in returning to work. In the second half of 2015 he had bacterial pneumonia twice. During the period of fall 2015 to March 2016, he was brought to our clinic in a wheelchair, appeared anemic, jaundiced and debilitated. He continued chiropractic therapy once every 2 weeks to retain mobility and independence. In April 2016, the patient passed away due to septic complications (7 year after myelofibrosis diagnosis).

Discussion

Primary myelofibrosis (MF) is a myeloproliferative neoplasm arising from clonal proliferation of haematopoietic stem cells. The expanding clone leads to reactive replacement of bone marrow by collagen fibrosis, osteosclerosis and neo-angiogenesis [3]. The underlying cause of MF is unknown but some characteristic mutations including the JAK2 and other genes have been demonstrated. Some MF patients experience severe extremity/bone pain. The origins of these pains are generally accepted to be a result of the expanding bone marrow, leukemic infiltration, periostitis, osteosclerosis, microfracture or insufficiency fracture [3]. As the bone marrow becomes fibrotic and normal haematopoiesis can no longer occur, extramedullary haematopoiesis (myeloid metaplasia) occurs. Foci of hematopoiesis may become clinically apparent as fibrohaematopoietic tumours in the spleen, liver, lungs, intestine, skin and other areas of the body. These aberrations may impinge upon the nervous system, subsequently causing painful symptoms and affecting the general health. An autopsy of a MF case with severe bone pain revealed osteoporosis with microfractures and periosteal leukaemic infiltration, which may have caused bone pain [4]. A severely enlarged spleen can cause abdominal pain and back pain as well.

The majority of the traditional therapies for MF are palliative [2]. Treatment aims at controlling anaemia, splenomegaly and relieving symptoms, and consists of different options. Allogeneic stem cell transplantation is the only potentially curative intervention; however, it

is associated with significant mortality and relapse rate [2]. Although JAK inhibitor therapy has been shown to improve patient constitutional symptoms and splenomegaly, it does not significantly reduce mutant allele burden in the majority of myeloproliferative patients [5]. A report described efficacy of low-dose single fraction radiation in 5 MF patients with intractable limb pain. Radiation therapy did relieve pain within days in 4 patients. The 5th patient did not respond to irradiation for a month, but had pain relief for several years after physical therapy [6]. Radiation therapy is not appropriate for an extensive treatment area which could cause serious hematological complications. Non-pharmacologic treatments commonly used for cancer pain include massage, acupuncture, biofeedback, meditation and hypnosis.

The role of spinal manipulation in the relief of pain is becoming clearer as time passes [7]. Theories pertaining to the chiropractic adjustment include the reduction of nerve root encroachments [8], release of entrapped intraarticular synovial fold [9], suppression of inflammatory mediators [10], and the release of beta-endorphin [7]. Psychoneurochemically the net effect of all the above is to reduce pain generation or its aggravation caused by anxiety. These conjectures are supported in both theory and fact. As illustrated in our case, the patient had hypertonicity of the paraspinal muscles, probably caused by bone marrow pathologies, microfractures or extramedullary haematopoiesis. Chiropractic treatment appeared to offer an effective approach in reducing stress, increasing mobility and strength, and achieving overall function and well-being. Chiropractic manipulation would appear to be one of the leading alternatives to relieve painful symptoms following surgery, chemotherapy or radiation therapy [11].

Conclusion

This report describes a case where pain control was satisfactory with chiropractic care in a patient with myelofibrosis. In rare diseases like myelofibrosis, the main limitation of our report was the lack of the related references for comparative analysis. Further studies regarding the efficacy of chiropractic therapy in controlling various cancer pains are needed to guide decision making.

Conflict of interests

None.

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