

Dramatic Remission of Hormone Refractory Prostate Cancer Achieved with Extract of the Mushroom, *Phellinus linteus*

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Key Words

Prostate cancer · Relapse · Mushroom · Remission

Abstract

At present, there is no distinctly effective treatment for hormone refractory prostate cancer. We describe a hormone refractory prostate cancer patient with rapidly progressive bone metastasis who showed dramatic response to intake of an extract from the mushroom, *Phellinus linteus*.

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Introduction

Most advanced prostate cancer patients respond well to the initial hormonal treatment, but once the disease obtains a hormone-independent character, cancer control becomes very difficult and shows a poor prognosis. At present, there is no effective therapy for hormone refractory prostate cancer and urologists usually provide only palliative treatment in such cases. We encountered a case of advanced prostate cancer that became resistant to all kinds of hormonal and radiation therapy, but improved dramatically with oral intake of an extract from the mushroom, *Phellinus linteus*.

Case Report

A 68-year-old prostate cancer patient (grade 3) with an initial diagnosis of local capsular invasion developed a hormone refractory status after 28 months of hormonal treatment. He was initially treated with androgen-deprivation therapy using an LH-RH agonist

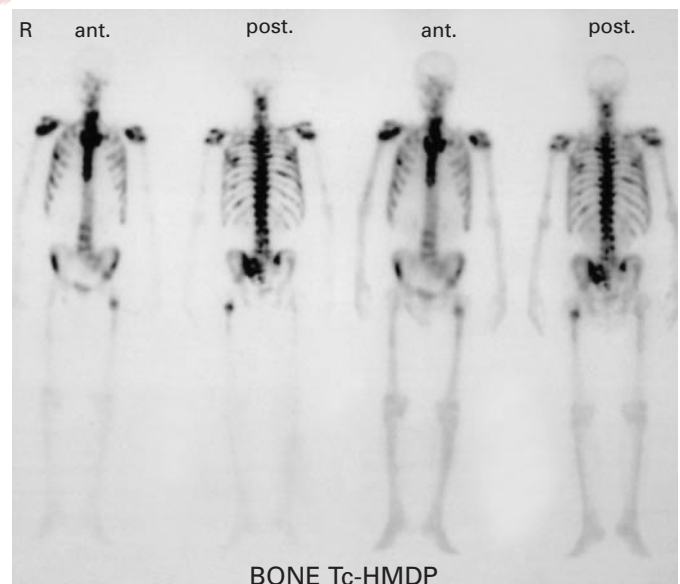


Fig. 1. Bone scintigraphy image after relapse of the prostate cancer. Abnormal uptake of radio isotope was observed suggesting multiple bone metastases from hormone refractory prostate cancer.

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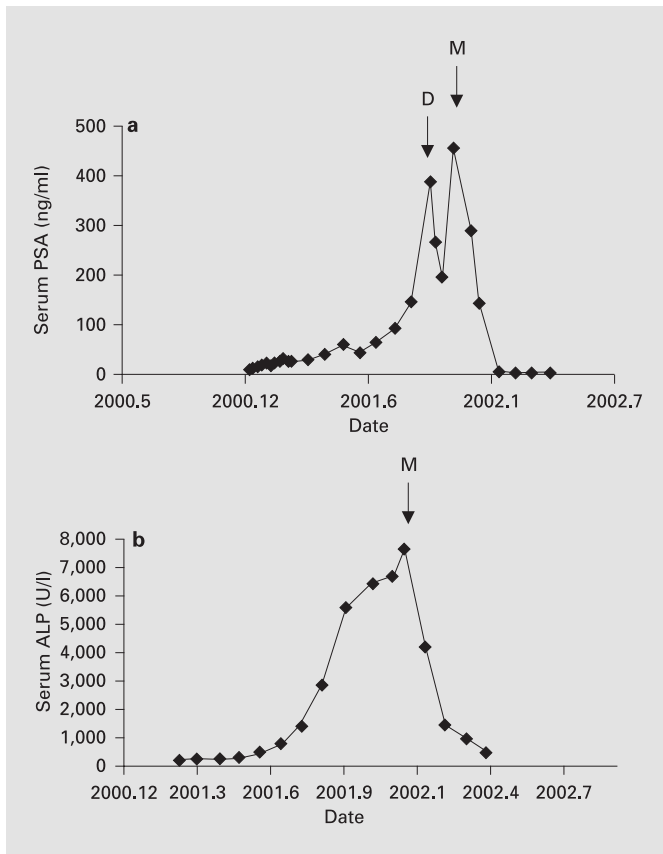


Fig. 2. Serum prostate-specific antigen (a) and serum alkaline phosphatase (b) decreased rapidly after intake of *P. linteus* extract. The arrow indicates the initiation of following agents. PSA = Prostate-specific antigen; ALP = alkaline phosphatase; D = diethylstilbestrol diphosphate; M = *P. linteus* extract.

and intermittent injection of diethylstilbestrol diphosphate (DES-DP; 250 mg intravenous injection, daily) was added after relapse of the cancer. He also received radiation therapy targeted to the prostate and right external iliac lymph node metastasis. Other treatments including bicalutamide, dexamethasone and estramustin were carried out, but the cancer continued to progress, becoming uncontrollable and resulting in multiple bone metastasis and bladder invasion 60 months after the initial treatment (fig. 1). Prostate specific antigen (PSA) level increased in an exponential manner and he developed lumbago, micturition pain and leg edema. Suddenly, his PSA and alkaline phosphatase (ALP) rapidly decreased (fig. 2) and rapid improvement in leg edema and pain were observed. The enlarged prostate projecting toward the bladder reduced promptly, parallel to the PSA decline (fig. 3). The cause of this phenomenon appeared to be the result of ingesting extract of *P. linteus*, which he had started as a traditional remedy on his own initiative. The PSA level has remained normal even after 12 months.



Fig. 3. Computed tomography and magnetic resonance image of the prostate before and after the intake of *P. linteus* extract. Projection of prostate toward bladder (a) reduced promptly after intake of *P. linteus* extract (b). The arrows indicate the enlarged prostate due to hormone refractory prostate cancer progression.

Discussion

Treatment of diseases with herbal medicines is put to clinical use in Japan, and treatment of various neoplasms with many kinds of mushrooms has been pursued as a traditional remedy in Japan. Recently, a growing population of cancer patients, including prostate cancer patients, has been taking *P. linteus* extract due to advertisements by dietary supplement companies reporting effective cases. In the case we encountered, a rapid decrease in PSA value was observed, which finally even normalized. Therefore, we cannot ignore the effect of *P. linteus*. In studies reported to date, the anti-tumor effects of mushroom extracts on prostate cancer cell lines grown in nude

mice were confirmed [1]. Some of these reports suggest a synergic inhibitory effect of mushroom extracts with diethylstilbestrol [2, 3]. The present case was being treated with oral intake of DES-DP when he started the self-administration of *P. linteus* extract, suggesting the synergic effect of *P. linteus* extract with estrogenic agents.

The exact mechanism underlying the effect of the extract was unknown, but one possibility was due to various polysaccharides included in the extract. Beta-D-glucan, richly included in the extract, may have influenced the immune system of the patient to inhibit the cancer growth. Another possibility underlying its effect may depend on its estrogenic effect. In our preliminary result, influences of the extract on estrogen receptor expressions were suggested. The further basic research on *P. linteus* is now being performed in our laboratory.

Treatment with *P. linteus* extract may be an alternative therapy for hormone refractory prostate cancer.

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