Case Series

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Long-term survival rates of cancer patients achieved by deuterium depletion as an adjuvant treatment in spinal astrocytic glioma, carcinoma mammae and melanoma malignum

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Abstract

The anticancer effect of deuterium depletion has been proved in various types of cancer, either in combination with conventional therapies or as a single treatment. Here we present 3 case studies illustrating 3 different cancer types. The first patient was diagnosed with spinal astrocytic glioma, a very rare cancer type. In her case, conventional therapy was and could not be used, but she consumed Deuterium-Depleted Water (DDW). Her follow-up time was 21 years. The second one was diagnosed with carcinoma mammae, worldwide the second most common cause of cancer-related death in women. She was operated, left side mastectomy was done, and metastases were found in 8 out of the 9 removed lymph nodes. She received chemo- and radiotherapy and started DDW consumption one month after the surgery. Her follow-up time was 24 years. The third patient was diagnosed with malignant melanoma, a highly aggressive skin cancer, currently the fifth most common cancer in men and seventh in women. He was operated, then 3 years later liver metastasis was detected, and chemoembolization was done. Afterwards, the patient started a oneyear DDW cure, then repeated several cures of various durations, in the subsequent 26 years. These cases confirm that deuterium depletion is effective both as a single treatment and in parallel or subsequent use with conventional therapies. DDW causes regression of the tumors and is an efficient therapeutic modality to achieve better patient outcomes.

Keywords: Spinal astrocytic glioma; Carcinoma mammae; PT2B1 tumor; Melanoma malignum; Metastasis; Deuterium-depleted water; Median survival time.

Introduction

The biological roles of naturally occurring Deuterium (D), heavy isotope of hydrogen, especially in cell growth, have been described more and more precisely since the first reports in the early 90's [1]. Today, D is known to play a determinative role in cell cycle regulation, gene expression, and cancer development Open J Clin Med Case Rep: Volume 9 (2023)

Vol 9: Issue 33: 2121

[2]. Beyond that, D exerts a significant impact on numerous other biological processes, such as aging [3], long-term memory [4], cell metabolism [5,6] and physical performance [7]. Deuterium depletion, achieved by using water with reduced deuterium content (deuterium-depleted water, DDW) has an apoptosis-triggering effect, observed both *in vitro* [8] and *in vivo* [9-12]. Beyond that, D depletion impedes tumor cell growth by causing oxidative stress [10,11] and reduces their migration [13]. The anticancer effect of D depletion was confirmed, among others, in a 4-month-long, double-blind, randomized human phase 2 clinical trial on prostate cancer [14]. The clinical data of over 500 DDW-consuming cancer patients, collected, evaluated, and published [1,8,15,16,] indicated that the combination of D depletion with the existing therapies (surgery, radio-, chemo-, and hormonal therapy) achieved severalfold increase of Median Survival Time (MST).

In this report, we substantiate the high efficiency of D depletion by presenting three different tumor cases with 21, 24, and 29 years' follow-up time. In one case conventional therapy was not used (patient #1), in the other two cases, DDW was applied when patients were facing rapid disease progression and poor prognosis with conventional therapy (patient #2, patient #3). The common feature of each patient was that they were considered "hopeless" cases.

The aim of these retrospective case studies was to confirm the impact of D depletion on the outcome of cancer patients.

Case Histories

In the following sections, we report detailed case histories of 3 patients with different cancer types, who received DDW as adjuvant/supportive treatment.

Patient #1 Spinal astrocytic glioma

Spinal astrocytic gliomas are extremely rare, and at present no standard of therapy is available [17]. Treatment options are limited; in a follow-up study of Jiang et al the mean recurrence-free survival duration was 19 months [18]. Progression is relentless; median survival is thirteen months in children and six months in adults [19].

An 11-year-old girl developed back pain in April 1999. A routine MRI scan of the spine was performed, and no significant deformation was found. After a diagnosis of scoliosis, physiotherapy was recommended.

A year later, a gradual loss of dexterity in her left hand was noticed. A few months later, in April 2000, an MRI examination confirmed an intramedullary lesion in the cervical spine at the heights of CII-CVII. This lesion was classified as spinal cord astrocytoma. A series of laminectomies was done, in this case, there was no other therapy available.

The patient started consuming DDW within four months after diagnosis and operation, continued drinking it uninterruptedly in the first eight years and periodically in the subsequent 6 years (Table 1).



Table 1: Sequence of events of diagnosis, therapy and DDW application in the case of Patient #1 in an overall time span of 14 years (3,090 days).

Time/period	Event	Duration of DDW cure (days)		
April 2000	Tumor diagnosed	-		
April 2000	Decompression surgery	-		
11 August 2000 - 10 March 2008	DDW cure #1	2,767		
10 March 2009 - 20 June 2009	DDW cure #2	102		
10 February 2010 - 20 May 2010	DDW cure #3	99		
10 March 2012 - 11 April 2012	DDW cure #4	32		
10 May 2013 - 09 June 2013	DDW cure #5	30		
10 September 2014 - 10 November 2014	DDW cure #6	60		

On the post-surgical MRI, bone deficiency and non-space-consuming fluid collection were described. The next MRI scan, taken in March 2001, showed that the previously observed oedema at the height of the laminectomy disappeared. The regularly performed MRI controls showed a gradual regression between 2000 and 2010 (Figure 1). In January 2010, the tumor size was 2 cm smaller compared to MRI scan taken three years earlier, in 2007. In 2014 MRI scan did not confirm any morphological abnormalities.

The patient felt very well, had no complaints, and decided not to have further control examinations. She began university studies. In 2018, four years after the last DDW cure, the patient had no complaints. The patient died of pulmonary embolism in 2020, 6 years after the last DDW course. The source of the embolism was unknown but was considered to be unrelated either to the astrocytoma or to deuterium depletion. At the autopsy, the tumor could not be observed anymore.

Patient #2 Carcinoma mammae

Breast cancer is worldwide the second most common cause of cancer-related deaths in women. The morbidity of breast cancer is high, although population screening by mammography can ensure early

Vol 9: Issue 33: 2121

detection of the disease with good chances of successful treatment [20]. MST in advanced breast cancer, determined by different clinical trials, is between 12 and 31 months [21]. In metastatic breast cancer, it is even less; MST and median progression-free survival is 28.0 and 17.1 months, respectively [22].

A 37-year-old woman developed breast cancer. During a medical examination, in September 1999, a dense mastopathy was palpable in the left mamma, next to the mammilla, and the MRI scan showed a corresponding bean-sized shadow with sharp contours. Histological classification of this primary tumor was pT2B1. In April 2000, she underwent left side mastectomy, whereby metastases were found in 8 out of the 9 removed lymph nodes. Still in the same month, another lump appeared on her neck, justifying chemotherapy, and she also received 25 radiotherapy fractions. One month after surgery, in May 2000, she started consuming DDW. Simultaneously, she continued drinking DDW, and did that uninterruptedly for 5 years (1,789 days). Then, she made repeated DDW cures periodically in the subsequent 17 years up to 2022 (Table 2).

In September 2000, the tumor on the patient's neck disappeared. During the subsequent tests, the findings were negative, and the patient has been fine ever since. In December 2008, she underwent breast correction surgery.

Time/period	Event	Duration of DDW cure (days)
September 1999	Tumor diagnosed	-
April 2000	Surgery: mastectomy and removal of 9 lymph nodes	-
April 2000, after surgery	Lump detected on the neck	-
10 May 2000 - 04 April 2005	DDW cure #1	1,789
01 November 2005 - 31 January 2006	DDW cure #2	91
01 March 2006 - 18 July 2006	DDW cure #3	139
01 February 2007 - 10 April 2007	DDW cure #4	68
10 October 2007 - 10 January 2008	DDW cure #5	92
December 2008	Breast correction surgery	
16 December 2008 - 22 January 2009	DDW cure #6	37
17 February 2009 - 15 April 2009	DDW cure #7	57
01 December 2021 - 11 February 2022	DDW cure #8	72

Table 2: Sequence of events of diagnosis, therapy and DDW application in the case of Patient #2 in an overall time span of 22 years (2,345 days).

Patient #3 Melanoma malignum

Melanoma, an aggressive skin cancer, is currently the fifth most commonly diagnosed cancer in men and the seventh in women [23]. Malignant melanoma is one of the most common tumors that metastasize to the gastrointestinal tract, in 58.3% of all cases in the liver [24]. The current prognosis of metastatic malignant melanoma is extremely poor: life expectancy of patients with metastatic disease is between 2 and 8 months [25].

Vol 9: Issue 33: 2121

A 46-year-old man was diagnosed with melanoma malignum, in 1991, when a 4 x 1.5 cm section of skin on his left shoulder was detected, containing an unevenly pigmented area, a part of which protruded from the skin surface. Histological examination revealed melanoma malignum, Clark III. The malignancy was operated in November 1991. Knowing that the tumor cells may spread to the lymphatic system, the axillary lymph nodes on the left side were removed in April 1992.

In October 1994, metastases appeared in the liver. A 3 cm size hypervascular mass was seen in the left lobe, further 3 ones in the right lobe, as well as some other foci accumulating the contrasting agent. Chemoembolization was done, and the patient started a DDW cure of one-year duration, then made several cures of various lengths periodically in the subsequent 26 years (Table 3).

Already in 1995, the test results showed regression. In the left lobe, one of the two malignancies became smaller, while the other remained unchanged. In the right lobe, one was reduced in size and the two others regressed completely.

In 1996, the changes in the left lobe of the liver completely disappeared.

In 1999, the small, residual changes, described in 1996, were no more detectable by CT.

In 2000, the patient received negative control outcomes. In the liver, residual tissue without signs of malignancy was detected.

Total number of days of DDW consumption was 9,846 until the end of the follow-up period. Subsequent to the start of DDW consumption, continuous regression was observed.

		/
Time/period	Event	Duration of DDW cure (days)
1991	Tumor diagnosed	-
November 1991	Skin surgery	-
April 1992	Surgery of the axillary lymph nodes on the left side	-
October 1994	Metastases diagnosed in the liver	-
20 October 1994 - 01 October 1995	DDW cure #1	345
13 February 1996 - 04 February 2012	DDW cure #2	5,832
15 May 2012 - 06 December 2014	DDW cure #3	945
05 January 2015 - 01 November 2018	DDW cure #4	1,395
05 January 2019 - 01 September 2021	DDW cure #5	969
15 October 2021 - 10 October 2022	DDW cure #6	360

Table 3: Sequence of events of diagnosis, therapy and DDW application in the case of Patient #3 in an overall time span of 26 years (9,846 days).

Conclusion

The cases presented show that, after the start of DDW consumption, progression could be avoided, and a symptom-free status with good quality of life could be maintained for decades. These results are consistent with earlier findings with different tumor types including breast, lung, pancreas, and prostate cancer, and CLL, when integration of deuterium depletion into conventional therapies resulted in a severalfold increase in median survival time.

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