

Historia medicinae

Prostate brachytherapy in 1909

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This case history, from Vienna in 1909, is of historical interest as it is possibly the first published report of a prostate neoplasm treated by brachytherapy.

Key words: prostatic neoplasms, radium, brachytherapy

Introduction

Prostate brachytherapy is currently enjoying a renaissance, due to computer and ultrasound technology, reactor created radionuclides, and early tumour detection. It is

often forgotten however, that the procedure had been the specialty of a few American centres prior to 1920 [1]. The case report reprinted below, translated from German, preceded the published French and American experiences.

Treatment of a sarcoma of the prostate with radium

“Based on a frequently published positive influence of radium salts on malignant tumours, we treated different tumours of the bladder with this method. We wish to report on a case of a sarcoma of the prostate, whose structure seemed to be especially significant. It seemed to us, that the tumour can be influenced by radium, caused by the histology – according to common experience sarcomas have a better response compared to other tumours – and on the other hand the tumour can be positioned in direct contact to the radium source, a basic need for the radioactive influence.

We report on the following case in the Department of Professor Zuckerkandl.

L. St. 32 years old, came into the clinic on the 31st July.1909. Apart of a gonorrhoea 12 years before, he was healthy. Over these years he had cystitis with retention twice and frequent terminal haematuria. The gonorrhoea was not completely healed, a temporary intensified secretion was left. Sometimes the patient had an increased urge of up to 15 minutes. Additionally he had after several years a pain in the perineum during bowel movement. At the very beginning of the last year the illness intensified: the urination became painful, the urge increased, the pain in the perineum and the rectum was increased, also when he walked. Since 1st July 1909 a severe haematuria and at the end of July complete retention with frequent placing of catheters. The physicians diagnosed an expansion of the prostate, which led to a diagnose of a tumour of the prostate. Following the resulting examination in the department: The digital examination through the rectum resulted in a tumour with an irregular surface whose left lobe had a size of an apple, which projected into the rectum. The right hand side was even larger, the upper border could be touched. From this point

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the tumour infiltrated towards the pelvis. The tumour was tough, when it was touched, it was very sensitive. A cystoscopy could not be performed due to heavy bleeding. A permanent catheter was not possible. The clinical diagnose was: Tumour of the prostate.

A radical operation could not be performed according to the above result. Prof Zuckerkandl decided to make a fistula of the bladder. The operation was done on 5th August.1909 and showed a huge tumour with exterior ulceration if the tumour, nodes reaching into the bladder and which infiltrated the wall of the bladder. Totally the tumour reached the size of a fist. Some parts – of the size of a nut – were taken out with a spoon. After 14 days the fistula was formed, and the patient got a portative-apparatus.

The histological examination resulted in spindle-cell sarcoma (Spindelzellen-sarcoma). We decided to irradiate the tumour from the fistula with radium.

An instrument containing 4.7 mg radium bromide was inserted from the fistula into the bladder, the capsule with radium was placed directly onto the tumour. The patient received 21 applications, lasting approximately 20 minutes each in intervals of 2 weeks. The last application was in June 1910. At this time the “vacancy for the illness” was over and the fistula had to be closed. The closure happened spontaneously after a two week placement of a permanent catheter. In the beginning the patient urinated every 2 hours; the urge was free of pain, the urine was without blood; afterwards the frequency increased to 3 to 4 hours; the general condition of the patient was excellent.

At the place of the huge tumour the rectal digital examination showed a flat, absolutely not sensitive to any pressure, not strongly definable infiltration, leading towards to the pelvis at the right hand side. The prostate could not be differentiated.

Cystoscopically (examination on 16th July 1910) we saw at the neck of the bladder prominent thick tissue like a cystitis of the prostate. Capacity about 120 cm³. Urine had a good concentration, slightly cloudy.

We are far from thinking that the patient is healed, but from an objective point of view, we saw a dramatic improvement, which can be compared to a complete cure: a result which is amazing, because sarcomas of the prostate with or without operation have a rather bad prognosis. The operation made in the course of the treatment was not a radical operation, a spontaneous cure of a sarcoma could also not be assumed, with the result that the success must be caused by the radium bromide used. Looking at the bad prognosis of the illness this treatment must be tested in further cases. Whether there is a permanent cure can only be shown in future, but even if it was not the case, radium was very successful in this case.

About the consequences of the endovesical treatment with radium – with an increased amount of radium – of other tumours of the bladder und changes of the prostate we will probably be able to report”.

Discussion

This case history from the Rothschild Hospital, Vienna, was written by Rudolf Paschkis & Wilhelm Tittinger [2]. It relates the treatment of a locally advanced tumour treated by the suprapubic approach, with a favourable outcome. Their chief, Otto Zuckerkandl (1861-1921) was a prominent urologist (the perineal prostatectomy was once known as *Zuckerkandl's Operation*). The report contains a single illustration of a histological section of the tumour, but no literature references.¹

This case history predates the reports of prostate brachytherapy by Pasteau & Degrais in Paris [3, 4], Young in Baltimore [5, 6], and by Barringer in New York [7-9]. Paul Degrais had co-authored *Radiumtherapy* with Louis Wickham (English edition, 1910), which contained

a single sentence regarding radium in prostate cancer: ‘In cancer of the prostate gland, one can act either on the perineal region or on the gland itself, by the introduction of an apparatus into the rectum, or a radiferous tube into the growth’ [10]. Whether they were referring to their own experience is unclear; it is also unclear whether the last part of the sentence describes interstitial or intra-urethral application.

In their papers a few years later [3, 4], Pasteau & Degrais related an intracavitary technique, consisting of radium capsules in the urethra and rectum. They first applied this treatment in July of 1909 [4], which would predate Paschkis & Taittinger’s application; but Pasteau & Degrais did not support their diagnosis with pathology, and did not report the case until several years later.

William Newcomet refers to the work of Desnos and Pasteau & Degrais, in benign and malignant disease, respectively [11]. Dawson Turner allots a few sentences to intra-urethral radium for benign prostatic hypertrophy in the 1913 edition of his text, and refers to the work of Hugo Schüller of Vienna in benign disease [12]. Hugh

¹ This illustration has been reviewed by our University's prostate pathologist, Zhong Jiang, who described the histology as follows: “This is either poorly differentiated carcinoma (maybe prostate cancer) or epithelioid sarcoma. The cells are epithelioid looking but not in spindle shape”.

Hampton Young, citing a paper presented by Pasteau & Degrais in London in 1913, obtained 100 mg of radium and began a programme in Baltimore [13]. His treatment consisted of radium capsules applied to the prostate along its rectal, urethral, and bladder surfaces. He was able to avoid serious mucosal injury by carefully rotating application sites.

Benjamin Barringer's work represented a major advance. He performed *transperineal interstitial implants*, using thin glass radon tubes within hollow needles [14]. His early attempts left the needles in situ for several hours; he later implanted radon seeds permanently. He is therefore the father of both high dose rate and permanent low dose rate prostate brachytherapy.

It is, of course, difficult to establish that a publication is the 'first', because there may well be an earlier, as yet unearthed, publication. Paschkis & Tittinger's report, however, is earlier than any of the reports cited by brachytherapists of the era.

We invite *Nowotowory* readers to inform us of any earlier publications that they may be aware of. We also would like to learn about the careers of Rudolf Paschkis, Wilhelm Tittinger, or Otto Zuckerkandl, and about the Rothschildspitales of Vienna.

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