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Clinical Case of the Month

Prostate cancer: a hazard also to be considered in the ageing male patient with spinal cord injury

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Introduction

Prostate cancer is the second most frequent tumor and the third cause for cancer related death in males in the industrialised countries.[1] The incidence has been shown to gradually rise over time.[2] The majority of men affected are between 65 and 85 years old and the disease is rare before the age of 50. There are racial differences in disease incidence: the clinical disease is relatively rare in Asia but more common in the Western countries.[3]

The cause of prostatic cancer is unknown but it has been postulated that a disturbance in the androgen-oestrogen balance with age might play a role. However the list of possible related causes is long and for none the cause-disease relation has been solidly proven. Probably a very complicated interaction of many different factors is at stake.[4] Growing age and higher incidence are related, both for clinical disease and for microscopically proven but clinically latent prostate cancer.[5]

The overall survival of patients with spinal cord injury has improved tremendously during the last decades. This implies that more male paraplegics and tetraplegics survive to their sixth, seventh or eighth decade.

It would seem logical that in a substantial number of them prostate cancer might develop.

Case presentation

Mister L, 66 years old, developed 8 years ago a vascular malformation in the spine, resulting in a complete paraplegia (Frankel A) motor T9, sensory T10. No recuperation occurred during follow-up. He has areflexia of the lower limbs and developed an areflexic neurogenic bladder which he managed to empty regularly with abdominal straining. His personal history shows a transurethral prostatectomy the year before the spinal disease occurred. Four years after he became paraplegic he had surgery for severe reflux oesophagitis. During the last 3 years he shows on urodynamic investigation a slow but gradual evolution towards a low compliance–high pressure bladder which is treated with anticholinergic/antispastic drugs. Control urodynamics show a cystometric bladder capacity of 600 ml, maximum detrusor pressure 60 cm H_2O at maximum capacity, compliance of 10 ml/cm H_2O. The bladder emptying becomes incomplete and he is starting to perform intermittent selfcatheterization five times a day. The intravenous pyelography 5 years after the onset of the paraplegia shows minor dilatation of the pyelum and calices. An isotope renogram 6 months later shows slower than normal secretion.

Urinary tract infection was no problem until 6 years post onset of the paralysis. He has regular catheterization problems and urinary infection. The catheter can be passed with great difficulty now and then. Cytoscopy shows several traumata of the urethral wall in the sphincteric region.

A blood screening test shows all values normal except the prostate specific antigen (PSA) which is 6 ng/ml (normal <4 ng/ml).

A transurethral ultrasound shows a hypodense zone in the right prostatic capsule and a biopsy is taken. This shows a low differentiated invasive adenocarcinome of the prostate. Screening investigations for staging (CAT scanning of the abdomen, ultrasonography of the liver, total bone scan, RX of the thorax) show no metastasis or spreading of the tumor.

In summary a newly diagnosed localised prostate carcinoma, increasing difficulties with selfcatheterization, low compliance bladder and slight outflow problems of the upper urinary tract are the clinical data present when a decision has to be made for treatment.

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The different consulting experts give the following suggestions:

Dr Iwatsubo would firstly recommend total prostatectomy for the localized, poorly differentiated adenocarcinoma, which might respond poorly to antiandrogen therapy or irradiation. The patient may lose continence after total prostatectomy since the low compliance bladder and the incompetent bladder neck and sphincter may not allow selfcatheterization to keep him dry. If he is always incontinent, Dr Iwatsubo would recommend putting a semirigid type penile prosthesis to allow easier use of an external condom and to support his sexual activity. If the patient is continent and if a urethral stricture is the main cause of the difficulties in catheterization, Dr Iwatsubo would treat the stricture by urethrotomy and would let the patient try to catheterize again afterwards. If incontinence is very limited self catheterization can be continued and patient can wear a pad. Only where the condom catheter is refused and/or problems with catheterization occur can a permanent cystostomy be introduced. The patient needs to be followed for eventual recurrence of prostatic tumor lifelong.

Prof. Perkash writes that the recently diagnosed carcinoma of the prostate which seems to be localized is amenable to radical prostatectomy. This seems to be the best choice to hopefully cure him from prostatic carcinoma. This will also take care of the obstructive symptom due to dyssynergic sphincter most of which is removed during radical prostatectomy. The down side is that the patient will need to wear an external condom drainage for incontinence. The advantages will be to cure him from carcinoma and also to stop intermittent catheterization which he is doing now. If he has secondaries in the spine or locally in the pelvic, one could do an orchiectomy. But he may still need a chanel TURP (transurethral resection of the prostate), transurethral sphincterotomy and/or hormone therapy.

Prof. Stöhrer reminds us that the patient had a balanced voiding function during 6 years. Two problems have occurred that obviously changed his situation in the last 2 years. The patient has a low differentiated invasive adenocarcinoma of the prostate and technically intermittent catheterization is not practible anymore, because the passage through the urethra is blocked. The history also shows the problem of regular urinary infections. Prof. Stöhrer would advise the patient to have subcapsular orchidectomy as the treatment against prostate cancer that would least impair his quality of life. In case the urethra is closed by the carcinoma or by a stricture an attempt to reopen the urethra in order to continue catheterization is certainly justified, when the surgical expenditure is justifiable. If the prostatic carcinoma includes the external sphincter area, a suprapubic catheter to avoid the risk of stress incontinence is a better treatment option. Radical prostatectomy could be considered also when the tumor does not expand beyond the capsule, the patient accepts the use of a condom urinal, and accepts the operation, regarding his overall condition and all possible alternatives.

Discussion

This case was chosen because it combines different clinical features which all have to be taken into account when treatment is decided upon.

The patient is 66 years old, complete paraplegic. His urodynamic condition is not good as it bears risk factors for the future: high pressure/low compliance bladder, secretion difficulties of the kidneys, a former way of bladder emptying which had to be changed to intermittent catheterization which in its turn gives more and more problems, recurrent urinary tract infections. On top of this a low differentiated invasive adenocarcinoma of the prostate has been diagnosed. All these data have some weight in the decision making.

Despite the fact that the patient has a complete T9 motor paraplegia, theoretically above the motor nuclei for the bladder and sphincter, his lower limbs and lower urinary tract are flaccid and areflexic. This phenomenon has been well documented and explained by a longitudinal injury to the cord or vascular injury to the distal cord in up to one third of the cases.[6] A variability in cord to column correlation and damage to the detrusor muscle from overdistension, eg during spinal shock may be other cause of areflexia.

zDetrusor areflexia might be classically described as associated with a decent capacity bladder with high compliance. However it is obvious that in many of these patients decreased compliance develops, which most likely represents a response to decentralization.[7] Detrusor areflexia is generally accompanied by a competent but nonrelaxing smooth sphincter and a striated sphincter that retains some tone, even if it is not under voluntary control and shows absent or diminished EMG activity.[8] Such urodynamic condition can be dangerous. Low compliance bladder with sufficient urethral resistance implies that during a too long period of bladder filling the pressure is above the critical value of 40 cm H_2O which may result in functional obstruction of the upper urinary tract at the level of the ureterovesical junction and in upper tract changes in the absence of reflux. It is well known that the essence of prevention of upper tract complications lies in the monitoring programme which can include morphological as IVP and functional studies as renal radionucleide investigations.[9] If the function of the kidneys is shown to become compromised, treatment has to be given. The logarithm proposed by Gardner *et al*[10] is in this respect good for clinical use. The value of such prompt therapeutical reaction has been illustrated clearly over the years by the marked decrease in renal deaths after spinal cord injury during the last half century.[11,12] Urodynamic investigation will objectivate the pathological parameters and will permit a guide to the choice of treatment. In the patient presented

here anticholinergic drugs were prescribed and bladder emptying was changed from straining to selfcatheterization. However selfcatheterization proved to become increasingly difficult after a while. Such problems tend to reappear regularly and may be related to false passages, local traumatisation or the development of a stricture.[13]

The most serious pathology in the short term however discovered through routine screening blood test was the prostatic carcinoma. This tumor would seem still localized on staging investigations.

Small foci of prostatic carcinoma are common at autopsy in elderly asymptomatic men. The incidence of such tumors increases with age from up to 14% at 50–60 years to up to 80% in men over 90.[14] Incidental prostatic carcinoma is a poorly understood tumor. It is still an open question today how to determine if a localized prostate cancer discovered on screening or by accident will remain clinically silent or not. The natural evolution of a prostate cancer can show a wide variation which depends probably on the interaction of a surplus or proto-oncogens, the presence of oncogenes, tumor suppressor genes and genetically driven changes in relation to cell invasiveness and metastasing. Typically a prostatic carcinoma arises in the periphery of the posterior part of the prostate which means that previous transurethral or open prostatectomy for benign hyperplasia do not influence the chances to develop a cancer.

A decisive factor associated with progression of the disease and decreased survival would seem to be the degree of differentiation of the neoplasm: there would seem to be sufficient data to merit aggressive therapy in most cases of high grade lesions[14] as found in our patient. However the curability of this grade of tumor is not uncommonly much more uncertain than one would hope and understaging during diagnosis proves not unfrequent.

In the literature several recent publications deal with the occurrence of cancer in pelvic organs in spinal cord injured people: bladder cancer[15,16] and colorectal cancer.[17] Data on prostate cancer in spinal cord injury patients are scarce. To test the hypothesis that carcinoma of the prostate is uncommon among patients previously paralysed due to myelopathy, the prevalence of this cancer was compared in patients with severe (unable to stand) and less severe (able to stand) paralysis.[18] Age, race, duration and level of paralysis, stage and fraction of prostate cancer diagnosed incidentally were similar in both groups. The authors found a severe to less severe ratio significantly lower than the expected ratio and therefore conclude that severe paralysis due to myelopathy is underrepresented among myelopathy patients with prostate cancer and is therefore a relatively low risk factor for carcinoma of the prostate gland. Other studies on the incidence of prostatic cancer in spinal cord injuries would seem lacking but it is difficult to imagine that acquired paralysis could prevent prostate cancer to develop if all possible causative mechanisms as far as they are known are considered.

It would seem logical therefore to include screening for prostate cancer in the ageing male SCI population. Digital rectal examination of the prostate (DRE) each year should be included in the urological follow-up. However the sensitivity of the test is not to exceed 30%, but the specificity is high (>80%).[20] PSA determination is not generally advocated for yearly screening as the level is dependent on several factors many of which are not related to prostate cancer.[2] Combining DRE and PSA or better PSA density[20] would seem to have a high sensitivity with a relatively good specificity.[19]

Treatment modalities of localized prostate cancer will not be discussed in detail here. Agressive treatment (radical prostatectomy or curative irradiation) is advocated whenever possible. But the final decision is made together with and by the patient.

The propositions made by the different consulted experts are very valuable and take into account the different aspects of this difficult clinical case, both those related to the urodynamic and to the oncological situation.

What actually happened with the patient

We explained diagnosis and treatment modalities in detail to the patient who decided after good reflexion not to have a radical prostatectomy or irradiation as he felt physically and psychologically unable to undergo such heavy treatment. Because of the unfavorable biopsy result he agreed that some treatment was needed and an intratunical orchiectomy was performed. During the same surgical session a transurethral incision was made through bladder neck and sphincter region. Since then the following 12 months evolution was seen: the PSA lowered to a level of 0.1 and remained so. Patient wears a condom for complete incontinence, has minimal residual urine (25 ml) which he evacuates three times a day with straining. He has had no symptomatic urinary tract infections during the last year. The control renal isotopic investigation showed better secretion of both kidneys.

He is followed for the prostate cancer and the urodynamic situation twice a year.

Conclusions

Better treatment has improved the life expectancy of spinal cord injured patients substantially. More SCI men reach the age where the incidence of prostatic cancer increases sharply. A screening for this cancer should be included in the yearly urological follow-up visit from 60 years of age at the latest. Decision of treatment of an incidentally found cancer will depend on many factors not in the least the decision by the patient himself.

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