

Prostatic Carcinoma

Prostatic carcinoma is the most often cancer in men over 50 years. It is the second most often cause of death for cancer (after lung cancer). That makes it serious medical problem.

Epidemiology

Incidence in the world grows every year up 2%. Incidence is higher in developed countries:

- Scandinavian countries: 60/100 000/year
- USA: 50/100 000/year
- Czech Republic: 41/100 000/year
- UK: 20/100 000/year
- China: 4/100 000/year

Risk Factors

- **age**
- genetics factors
- cigarette smoking
- fat rich food
- afroamericans
- cadmium, herbicides, pesticides

Pathology

Prostatic cancer is adenocarcinoma (in 95%), it has several subtypes:

- small-cellular AC
- mucinous AC
- sarcomatoidous AC
- intraductal AC
- carcinosarcoma
- bazaloid carcinoma

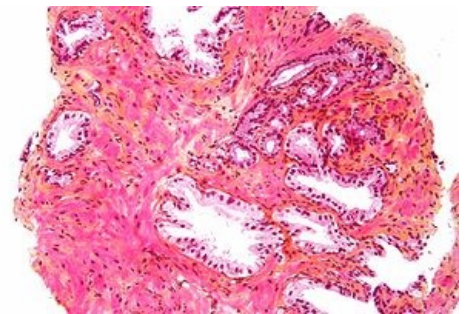
Prostate is divided into several zones, the most often localization of PC is in peripheral zone (70%),

- Local invasion to seminal ducts, urinary bladder, rectum (rare).
- Lymphogenous metastases to local LN.
- Hematogenous metastases can be found in bones (are osteoplastic (!), in pelvis, spine, ribs, femur, skull), lungs and livers

Clinical Features

PC has **no symptoms** in early stages. Later can be:

- thin stream of urine, difficult micturition,
- nykturia, urgency,
- hematospermia,
- hematuria (less than 15%),
- nephralgia (hydronephrosis),
- bone pain.



Microscopy prostatic adenocarcinoma.

Diagnostic Methods

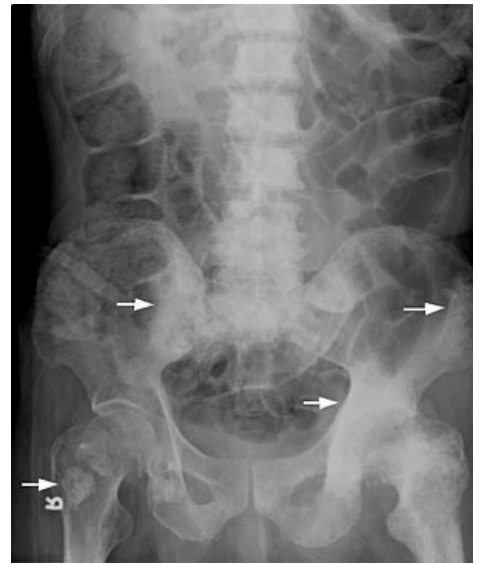
- **DRE** – digital rectal examination, simple examination method, positive predictive value is 30%.
- **PSA** – prostatic specific antigen, it is specific for prostate.
- **TRUS** – trans rectal ultrasonography, carcinoma is hypoechoic (60%) or isoechoic (40%) lesion, combined with **biopsy** and Power Doppler sonography (higher vascularization in tumors).
- CT and MRI have less sensitivity than TRUS, CT can serve for finding lymph node metastases.
- Bone scintigraphy - detecting bone metastases.

Staging and Grading

TNM

Size of the tumor, invasion:

- TX. = primary tumour cannot be assessed.
- T0. = no evidence of primary tumor.
- T1. = clinically inapparent tumour not palpable or visible by imaging.
 - T1a. = tumor incidental histological finding in 5% or less of tissue resected.
 - T1b. = tumor incidental histological finding in more than 5% of tissue resected.
 - T1c. = tumor identified by needle biopsy (e.g., because of elevated PSA).
- T2. = tumor confined within prostate .
 - T2a. = tumor involves one half of one lobe or less.
 - T2b. = tumor involves more than half of one lobe, but not both lobes.
 - T2c. = tumor involves both lobes.
- T3. = tumor extends through the prostatic capsule2.
 - T3a. = extracapsular extension (unilateral or bilateral).
 - T3b. = tumour invades seminal vesicle(s).
- T4. Tumour is fixed or invades adjacent structures other than seminal vesicles: bladder neck, external sphincter, rectum, levator muscles, or pelvic wall.



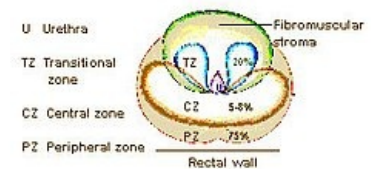
RTG: osteoplastic metastases in PC.

Regional lymph nodes (necessary examination of 8 lymph nodes):

- N0 = no LN metastases
- N1 = 1 LN metastase or more LN metastases (local!!)

Distant metastases:

- M0 = no distant metastases
- M1 = distant metastases
 - M1a = distant lymph node
 - M1b = bone(s)
 - M1c = others



Prostate zones.

Gleason's Grading and Score

Gleason's grading: grade 1-5 based on cell architecture, (histopathological grading), is primary (in the most prominent localization) and secondary (the next most prominent localization) grading.

Gleason Score is based on Gleason's grading (primary + secondary):

- score 2-6: very low on the cancer aggression.
- score 7: mildly aggressive.
- score 8-10: very high cancer aggression.

Therapy

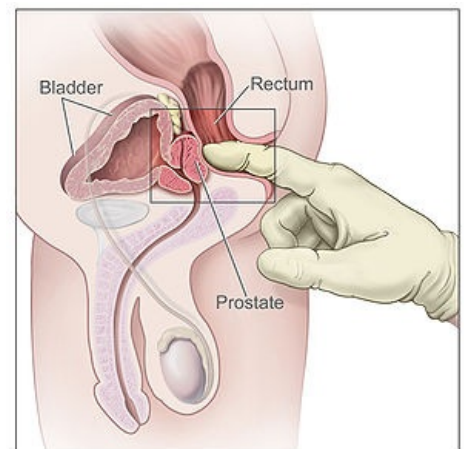
Conservative

Conservative therapy is based on existence of occult prostatic cancer (low risks).

- **Watchfull waiting** – indications: higher age of patient (expected life time < 10 years), very well or middle grading, or the patient does not want active therapy. Regular PSA, DRE, PSADT, scintigraphy, possible therapy in progression is hormonal.
- **Active surveillance** – active therapy is delayed till time of progression of disease. Indications: low risk cancer.

Active

- **Radical prostatectomy** – is resection of whole prostate with capsule and seminal ducts. Is necessary to adapt bladder neck and create vesico-urethral anastomosis, urine derivation by catheter usually 14 days. Indications: T1b-T2, GS ≤ 7, PSA ≥ 20 ng/ml, expected survival time > 10 years. Prostatectomy can be performed laparotomically, laparoscopically, robot assisted surgery. Possible complications are incontinence of urine or erectile dysfunction.
- **Radiotherapy** – up to 86 Gy, T1c-T2c, adjuvant, neoadjuvant...
- **Brachyradiotherapy** – indications: T1b-T2a, GS ≤ 6, PSA ≤ 10 ng/ml, tumor < 50g. Needle relasing seeds (permanent).
- **Kryotherapy** – by liquid nitrogen (-273 °C)



Digital rectal examination of prostate.

Hormonal

- 85% of PC's are androgen dependent!
- indications: metastatical PC, locally invasive, high grade, N1 after radical prostatectomy, with actinotherapy (neoadjuvant).
- types:
 - antiandrogenes – steroid (cyproteron acetate), nonsteroid (nilutamid, flutamid, bicalutamid).
 - castration (orchidectomy or drug castration - LH-RH analogs or antagonists)

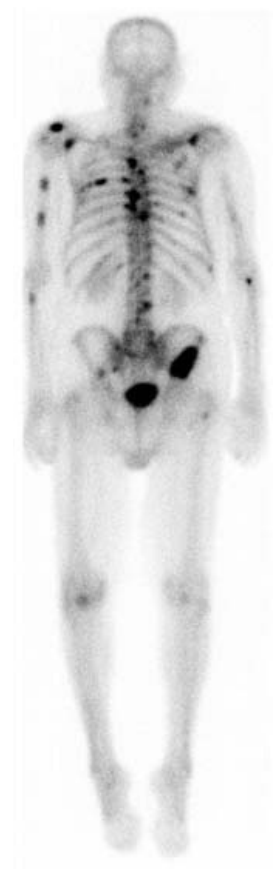
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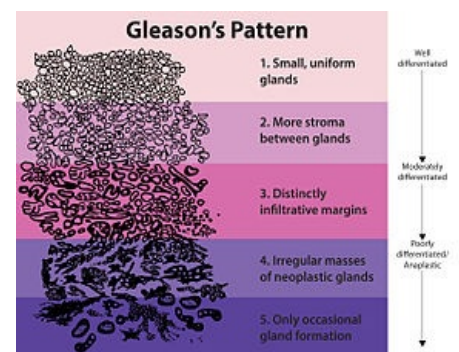
- Prostatic Specific Antigen

Bibliography

- ČAPOUN, Otakar. *Karcinom prostaty* [lecture for subject Urology, specialization General Medicine, 1. LF UK Charles University in Prague]. Prague. 2012.
- HANUŠ, Tomáš. *Urologie*. 1. edition. Triton, 2011. ISBN 978-80-7387-387-5.



Scinti: Bone metastases.



Gleason scale.

File:Brachytherapy.jpeg
Seeds for brachytherapy.