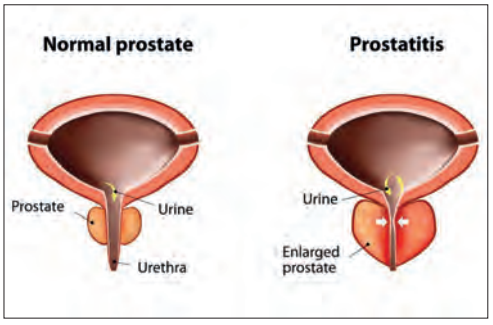
Olea MEDICAL
Improved diagnosis for life™

Did You Know?
Prostatitis

Take-home message

- In the United States, prostatitis is diagnosed in 2,000,000 medical visits each year **(Ref. 1).**
- In China and South Korea, where prostate cancer is rare, prostatitis is more frequently diagnosed.
- Imaging leads the diagnosis, clarifies the diffusion of the lesions and makes it possible to adapt the therapeutic strategy in complicated urinary infections.



- Prostatitis is the name given to a set of symptoms that usually caused by infection or by inflammation of the prostate.

This disease is more common in younger and middle-aged men, usually between 30 and 50 years. **Prostatitis affects about 10-14% of men.**

There are four types of prostatitis:

1. Acute bacterial prostatitis: this is an acute infection of the prostate.
2. Chronic bacterial prostatitis: it is a recurrent infection of the urinary tract and a chronic infection of the prostate.
3. Chronic Prostatitis / Chronic Pelvic Pain Syndrome.
4. Asymptomatic inflammatory prostatitis: not showing any subjective symptoms, but leukocytes are found in prostate secretions or prostatic tissue.

There is no indication for an imaging exam, but ultrasound and CT make it possible to detect semiology of pyelonephritis and to direct the diagnosis of an acute infection of renal parenchyma (Ref.2).

Complications

- An urgent or frequent need to urinate
- Signs of systemic inflammation (fever or hypothermia, tachycardia, tachypnea, hypotension, oliguria)
- Bladder tumors
- A prostatic abscess
- Pyelonephritis (bacterial infection that affects kidney)
- Urinary stasis (decrease or complete cessation of the circulation of the urine)
- Adenomitis: inflammation of adenoma
- Chronic prostatitis
- Prostate cancer

Possible therapy

- Painkillers
- Intravenous antibiotics, oral or both
- Prostate massage
- Hospitalization may be considered in the most severe cases
- In some cases surgery is necessary

In Olea Sphere®?

DWI and Kinetics plugins can be used to process prostate cases. This prostatitis case shows a diffuse hypo-intensity on T2 weighted images. ADC value is around 1.3 $mm2.s^{-1}$ showing no diffusion restriction **(picture 1)**. Computed diffusion ($b=2500\ s.mm^{-2}$) with IVIM plugin shows absence of focused hyperintensity in the peripheral zone. **(picture 2)**

Kinetics enhancement could be sometimes confusing with a washout curve due to hyperemia.

The use of high b-values or electronic b can better differentiate a cancerous lesion from an inflammatory prostatitis area.

Prostatitis and cancer could be differentiate using quantitative results from **bi-exponential IVIM (D and f).**
In both case values are different than normal PZ. On prostatitis D is clearly higher than cancer tissue, but lower than nomal PZ.

Remark: **f is higher than normal** in both cases (prostatitis and cancer)

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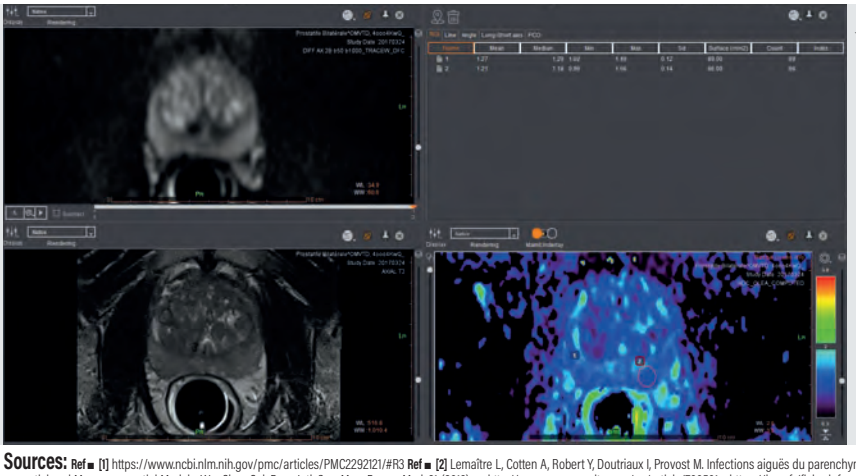
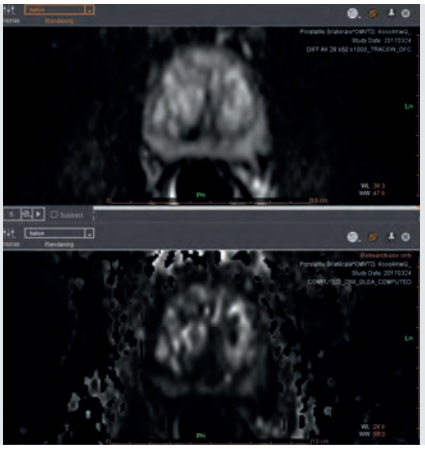
A different emerging technique tries to distinguish prostate lesions. Benignant tissue (like prostatitis) could also be differentiated from cancerous tissue using Diffusion Kurtosis Imaging.

This technique using higher b values quantifies Kurtosis apparent coefficient (K).



◄ Picture 1

Picture 2 ►



Sources: Ref ■ **[1]** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2292121/#R3 **Ref** ■ **[2]** Lemaître L, Cotten A, Robert Y, Doutriaux I, Provost M. Infections aiguës du parenchyme rénal de l'adulte. Rev Im Med. 1991; 3:295-303. Discrimination of Prostate Cancer from Chronic Prostatitis: Comparison between Biexponential and Monoexponential Models, WenChao Cai, Proc. Intl. Soc. Mag. Reson. Med. 21 (2013) ■ http://www.em-consulte.com/en/article/780501 ■ https://imm.fr/fiche-info-patient/le-diagnostic-du-cancer-de-la-prostate/ ■ http://www.em-consulte.com/en/article/121718#JR-02-2004-85-2-C2-0221-0363-101019-ART10-BIB4 ■ https://www.ameli.fr/assure/sante/themes/adenome-prostate/symptomes-diagnostic-complications#text_1110 ■ http://www.ptfarm.pl/pub/File/Acta_Poloniae/2012/4/571.pdf ■ http://www.rightdiagnosis.com/a/acute_bacterial_prostatitis/stats.htm ■ https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2292121/#R3 ■ https://prostatecanceruk.org//media/2492038/prostatitis-ifm.pdf ■ https://prostatecanceruk.org/prostate-information/further-help/prostatitis ■ http://campus.cerimes.fr/urologie/poly-urologie.pdf ■ http://therapeutesmagazine.com/prostatite-symptomes-causes-et-traitements/ ■ https://fr.medlicker.com/681-la-prostatite-causes-symptmes-diagnostic-et-traitements ■ http://www.infectionurinaire.org/prostatite ■ http://www.urofrance.org/nc/science-et-recherche/base-bibliographique/article/html/prostatite-aigue-bacterienne-chez-lhomme-adulte.html ■ http://sante-medecine.journaldesfemmes.com/faq/14112-prostatite-causes-symptomes-et-traitement ■ New RESOLVE-Based Diffusional Kurtosis Imaging in MRI-Visible Prostate Cancer: Effect of Reduced b Value on Image Quality, Yu-Dong Zhang, 330 AJR:207, August 2016 ■ V.A. // B.T. // A.M. //S.F. //F.C. //R.P.