Abstract 13.

The prostate anatomy, a useful tool for clinical practice: assessed through augmented reality

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Learning objectives
- To reduce the imprecision of the location of prostatic lesions.
- Describe the prostate anatomy in magnetic resonance through augmented reality.

Background
Prostate cancer is a substantial public health problem worldwide. It is the most common neoplasm among men and third-ranked cause of cancer death in Europe, with almost 400,000 cases and over 92,000 deaths. According to the data of Chile, there is an approximate mortality rate for prostate cancer of 17.2 per 100,000 inhabitants per year, being the second most common cause of death due to neoplasia in our country [1].

The introduction and widespread use of the Prostate specific Antigen testing (PSA) strongly modified the epidemiology of prostate cancer. Although it turned effective in reducing prostate specific mortality, the relevant over diagnosis and the side effects of treatment, it became necessary to use other diagnostic methods such as magnetic resonance imaging [1].

The timely management of this pathology, allows improving the quality of life of the patient, reducing mortality and
reducing costs associated with treatment. In the radiologist’s practice it is very important to describe the lesions, their location and the appropriate terminology, in order to have a greater consensus with the clinician and provide a more precise treatment with the best possible results [1].

The prostate is divided into 4 histological zones, the central zone, the transition zone, the peripheral zone and the anterior fibromuscular stroma.

- The peripheral zone comprises 70% of the gland and extends from the base to the apex of the prostate.
- The central zone is located at the base of the prostate, between the peripheral zone and the transition zone, includes 25% of the gland and surrounds the ejaculatory ducts.
- The transition zone forms 5% of the gland and is represented by 2 lobes that surround the proximal prostatic urethra.
- The anterior fibromuscular stroma corresponds to the anterior external surface of the prostate.

In the posterolateral aspect of the prostate, the neurovascular bundle is observed, which represents an important topic, as it is a path of neoplastic dissemination [2].

**Findings and procedure details**

- **Augmented reality**

  Is a live view of a physical, real-world environment related to elements generated by computer. It allows users to experience their surroundings at the same time they are viewing virtual information. Virtual reality unlike the augmented reality replaces the real world with a simulated one.

  Augmented reality supplements the real world with virtual objects that appears to coexist in the same space as the real world.

  With the help of advanced AR technology, the information about the surrounding real world becomes interactive and digitally manipulable [3].

- **Education and augmented reality**

  Students can use augmented reality to construct new understanding based upon their interactions with virtual objects, which bring underlying data to life [3].

**Conclusion**

- The division of the prostate gland and associated structures in sectors, standardizes the reports and facilitates the precise location of magnetic resonance guided biopsies, improving the therapy, the pathological correlation and the result of the surgery [2].
- Augmented reality provides opportunities for more authentic learning, giving students a more personalized and explorative learning experience.
- AR is in the early stages of application within healthcare education but it has enormous potential for promoting learning experience, achieving core competencies, such as decision making and effective teamwork in healthcare [3].
- This technological tool can be used for interactive learning techniques on simulation of procedures, among others [4].

**Personal information**

**References**