African Journal of Urology (2015) **21**, 84–85

HOSTED BY

Pan African Urological Surgeons' Association

African Journal of Urology

www.ees.elsevier.com/afju
www.sciencedirect.com

Opinion article

The Matador Technique: A technique to improve prostatic brachytherapy seed placement

A. Pai [a,*], **P. Rogers** [b], **A. Jones** [a]

[a] *Urology Department, Royal Berkshire Hospital, Reading, United Kingdom*
[b] *Oncology Department, Royal Berkshire Hospital, Reading, United Kingdom*

Received 8 February 2014; received in revised form 17 July 2014; accepted 11 August 2014

KEYWORDS
Brachytherapy;
Prostate cancer;
Seed implantation

Abstract
The accuracy of brachytherapy seed implantation is reduced by the movement of the prostate when needles are introduced transperineally. This report describes a simple method of introducing the first two needles, which reduces prostate deflection. This technique is analogous to the way a matador uses two barbed sticks to engage a rampaging bull: The Matador Technique.

© 2015 Pan African Urological Surgeons' Association. Production and hosting by Elsevier B.V. All rights reserved.

Introduction

Prostatic brachytherapy relies on the accurate placement of radioactive seeds within the prostate based on dosimetric planning. Accurate seed implantation is correlated with the success of the procedure and the reduction of side effects [1]. One of the challenges of seed implantation is the movement of the prostate when introducing needles transperineally [2]. This report describes a simple method of introducing the first two needles, which fixes the prostate and reduces subsequent prostate deflection.

Subjects and methods

The Matador Technique was employed in 604 consecutive patients treated with prostatic brachytherapy between November 2003 and August 2013 in a single institution.

Technique

The patient is prepared in the standard way with preoperative dosimetric planning and lithotomy positioning. A transperineal template and transrectal ultrasound are used to guide the placement of needles into the prostate. The first two needles are introduced simultaneously on either side of the midline. By this method the prostate is fixed, thus reducing rotation of the prostate and enabling subsequent needles to be inserted accurately. Needle positioning is checked and

* Corresponding author at: Royal Berkshire Hospital, Urology Department, London Road, Reading, United Kingdom.
E-mail address: aakashpai77@gmail.com (A. Pai).

Peer review under responsibility of Pan African Urological Surgeons' Association.

1110-5704 © 2015 Pan African Urological Surgeons' Association. Production and hosting by Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.afju.2014.08.005

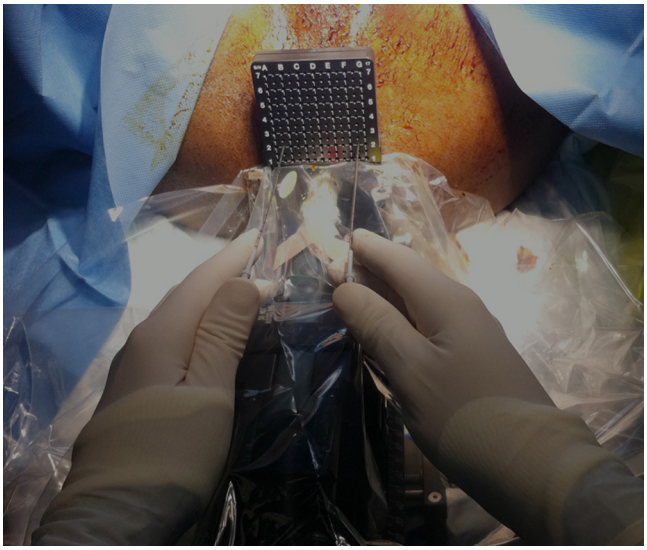

Fig. 1 Photograph of the Matador Technique: the first two needles are implanted simultaneously, through a prostatic brachytherapy grid. This reduces subsequent deflection of the prostate.

correlated with dosimetric planning. The seeds are delivered once the final needle position is established (Fig. 1.).

Post-implant CT scanning was undertaken prior to discharge, usually within 24 h following the procedure. The patients were subsequently followed with PSA surveillance.

Results

There were no complications as a direct consequence of using this technique.

Throughout our study, although we have not compared cancer specific survival, intraoperative transrectal ultrasound showed a reduction of prostatic deflection as a consequence of employing the Matador Technique.

Discussion

This simple technique of simultaneous insertion of the first two needles reduces prostate movement, thus enabling implantation of radioactive seeds with greater precision. Specially designed stabilisation needles which are inserted independently at the start of the procedure to reduce deflection have been used with limited success in other centres [3]. In addition, there are studies showing that stiffer tungsten carbide needles [4] and modification of the transperineal grid [5] reduce prostatic deflection. In our experience, the insertion of any needle independently (including stabilisation needles) causes rotation of the prostate.

Newer techniques include the use of needles with incorporated electromagnetic fusion sensors [6] and robotic-assisted needle placement [7–10]. However, further clinical trials are required before these techniques can be widely used.

The benefit of the Matador Technique is a marked reduction of prostatic rotation by simultaneous insertion of the first two needles on either side of the midline. Therefore, specific stabilisation needles are not needed; routine implantation needles can be used instead. This method has been successfully used by the authors in a large number of patients, thereby reducing prostatic deflection and improving seed placement.

Conflict of interest

The authors have no conflict of interest to declare.

References

[1] Stone N, Stock RG. Complications following permanent prostate brachytherapy. Eur Urol 2002;41(4):427–33.
[2] Wan G, Wei Z, Gardi L, Downey DB, Fenster A. Brachytherapy needle deflection evaluation and correction. Med Phys 2005;32(April (4)):902–9.
[3] Podder T, Sherman J, Rubens D, Messing E, Strang J, Ng WS, et al. Methods for prostate stabilisation during transperineal LDR brachytherapy. Phys Med Biol 2008;53(March (6)):1563–79.
[4] McGill l CS, Schwartz JA, Moore JZ, McLaughlin PW, Shih AJ. Effects of insertion speed and trocar stiffness on the accuracy of needle position for brachytherapy. Med Phys 2012;39(April (4)):1811–7, http://dx.doi.org/10.1118/1.3689812.
[5] McGill CS, Schwartz JA, Moore JZ, McLaughlin PW, Shih AJ. Precision grid and hand motion for accurate needle insertion in brachytherapy. Med Phys 2011;38(August (8)):4749–59.
[6] Sadjadi H, Hashtrudi-Zaad K, Fichtinger G. Needle deflection estimation: prostate brachytherapy phantom experiments. Int J Comput Assist Radiol Surg 2014;9(6):921–9. http://link.springer.com/article/10.1007%2Fs11548-014-0985-0
[7] Song DY, Burdette EC, Fiene J, Armour E, Kronreif G, Deguet A, et al. Robotic needle guide for prostate brachytherapy: clinical testing of feasibility and performance. Brachytherapy 2011;10(January–February (1)):57–63, http://dx.doi.org/10.1016/j.brachy.2010.01.003 [Epub 21.08.2010].
[8] Wei Z, Wan G, Gardi L, Mills G, Downey D, Fenster A. Robot-assisted 3D-TRUS guided prostate brachytherapy: system integration and validation. Med Phys 2004 Mar;31(3):539–48.
[9] Fichtinger Gl, Burdette EC, Tanacs A, Patriciu A, Mazilu D, Whitcomb LL, et al. Robotically assisted prostate brachytherapy with transrectal ultrasound guidance – Phantom experiments. Brachytherapy 2006;5(January–March (1)):14–26.
[10] Fichtinger G, Fiene JP, Kennedy CW, Kronreif G, Iordachita I, Song DY, et al. Robotic assistance for ultrasound-guided prostate brachytherapy. Med Image Anal 2008;12(October (5)):535–45, http://dx.doi.org/10.1016/j.media.2008.06.002 [Epub 18.06.08].