How to transition from Transrectal to Trans perineal Prostate Biopsy; experience after 1500 TP biopsies.

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Introduction

- Transrectal ultrasound-guided (TRUS) biopsy has been gold standard for prostate biopsy and performed in our institution since 1989.
- Due to the emergence of multi-drug resistant bacteria, rates of post-TRUS biopsy infection are increasing\(^1\)\(^2\).
- Studies have shown a marked increase in hospitalizations due to sepsis in recent years\(^3\)\(^4\).
- 1% hospitalization risk\(^4\).
- Deaths due to post TRUS sepsis have been reported (34/50,000)\(^4\).
Introduction

- Our institution has been performing TRUS biopsy since 1989
- Average 489 biopsies performed per year between 2010-2019
- Biannual QI meetings are held to detail post-procedure complications (as part of national guidelines)
- Our data showed increasing incidence of post-procedural sepsis over last 7 years causing us to explore switching to TP biopsy
- Decision made to make a transition to transperineal ultrasound-guided (TP) biopsy in April 2020
TP biopsy is generally the domain of urologists

- PubMed search of ‘Transperineal Prostate Biopsy’
- 100 most recent articles reviewed
- 85 were in urology journals
- 4/15 in radiology journals described ‘in-bore’ MRI guided biopsy
- 7/15 compared MRI to TP biopsy (TP performed by urology)
- 4 did not state who performed biopsies

- Need for TP biopsy is increasing exponentially
- If radiologists don’t move to TP they may be left ‘out of the loop’
Why did Radiology and not Urology decide to offer outpatient TP biopsy?

- Radiology already performed all the TRUS biopsies for urology in a well-oiled referral pattern
- Our sepsis rate was rising worryingly
- Most of our urologists were not performing TP biopsy or were offering it in a very limited way
- Two radiologists had experience in TP biopsy under general anesthetic and in guiding transperineal prostate brachytherapy for the radiation oncology service

Transition to Transperineal Prostate Biopsy Under Local Anaesthetic

- Traditionally TP biopsy is performed under general anaesthetic
- More recently TP biopsy with local anaesthetic described
- Two radiologists had experience in TP procedures under GA
- Radiologists travelled to an external centre with experience to observe TP biopsies performed under local anaesthetic
- Began performing TP Bx under local anaesthetic in April 2020
New equipment required, new costs

- Hitachi Bi-Plane Brachytherapy convex/linear Transducer and footswitch (€16,949.40)
- Modified lithotomy chair (€12,473.43)
- Applied and received funding through local hospital funding on basis of cost savings by reducing post-biopsy sepsis rates
- Negotiation with insurance companies for appropriate code for outpatient TP biopsy under local anaesthetic reflecting increased complexity but reduced risk complications

**Other Consumables**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mefix self-adhesive fabric tape (SCA Mölnlycke Ltd) 5cm</td>
<td>2 Strips - to elevate scrotum</td>
</tr>
<tr>
<td>Razor</td>
<td>To ensure aseptic technique</td>
</tr>
<tr>
<td>Chloraprep skin antiseptic (2% chlorhexidine gluconate + 70% isopropyl alcohol [CHG + IPA] in a 3.0-mL applicator) (Medi-Flex Hospital Products, Inc., Overland Park, Kan)</td>
<td>Time given to allow fully dry</td>
</tr>
<tr>
<td>Xylocaine 10mg/ delivered dose mucosal spray</td>
<td>Applied to perineal skin for added anaesthesia</td>
</tr>
<tr>
<td>1 x 25G needle and 1 x 20G spinal needle</td>
<td>25G needle for skin and 20g needle for deeper infiltration</td>
</tr>
<tr>
<td>2% lidocaine</td>
<td></td>
</tr>
<tr>
<td>Instillagel</td>
<td>Inserted per rectum</td>
</tr>
<tr>
<td>Condom type cover for Rectal Ultrasound probe</td>
<td></td>
</tr>
<tr>
<td>1 x 11 cm 17G Temno Introducer Needle and 1 x 16 cm 18G Biopsy Needle Gun</td>
<td>For taller or larger patients a longer system may be required (15cm introducer/20cm needle)</td>
</tr>
<tr>
<td>Specimen Containers</td>
<td>Prelabelled</td>
</tr>
<tr>
<td>Opsite Spray to skin after procedure</td>
<td>Dressings are not suitable for perineum</td>
</tr>
</tbody>
</table>
Transition and efficiency

- 6 TRUS biopsies per session had been performed prior to change
- Initially 2 TP biopsies per morning were performed by 2 GU radiologists – taking approximately 60 minutes
- After 2 months training, 2 more GU radiologists trained in the procedure and TRUS biopsies were abandoned completely
- After 6 months, 4 TP biopsies were performed per session, averaging 30 minutes; all attendings who previously performed TRUS were trained in TP
- Waiting lists have not increased due to better patient selection using MRI
- Residents are now performing biopsies under direct supervision
- Over first 6 months: average used of conscious sedation 35%
- Now rate of sedation is 13%
## Results – reduction in sepsis and bleeding

<table>
<thead>
<tr>
<th>Complication</th>
<th>TRUS (April 2019 – March 2020)</th>
<th>TP Biopsy (April 2020 – August 2022)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTI</td>
<td>9/590 (1.5%)</td>
<td>3/1499 (0.2%)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>23/590 (3.9%)</td>
<td>4/1499 (0.3%)</td>
</tr>
<tr>
<td>Acute Urinary Retention</td>
<td>1/590 (0.17%)</td>
<td>2/1499 (0.1%)</td>
</tr>
<tr>
<td>Severe Rectal Bleeding</td>
<td>1/590 (0.17%)</td>
<td>0/1499</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Cancer diagnosis</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUS Biopsy</td>
<td>384 (65%)</td>
<td>590</td>
</tr>
<tr>
<td>TP Biopsy</td>
<td>1004 (67%)</td>
<td>1499</td>
</tr>
</tbody>
</table>
Discussion

- By August 2022 1499 TP biopsies performed
- 4 performed per morning session, reduced from prior TRUS biopsy list of 6
- No increase in waiting list as fewer numbers require biopsy now that all patients have MRI and more have active surveillance
- Significantly reduced post-biopsy complication rates, while maintaining a functioning cancer diagnosis service
- Initial outlay of cost in setting up service more than offset by savings in TRUS-related sepsis costs

Radiologists are best placed to provide TP biopsy
- Radiologists are already adept at US guided biopsy
- Radiologists have MRI interpretative skills to optimize targeting possible cancers
- TP can access all lesions, including anterior and peri-urethral lesions
- With increasing multidrug resistance globally, and a much safer alternative available, sepsis after TRUS will be increasingly difficult to defend
THANK YOU

References


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