

DO CATHETER BAGS WITH INBUILT IRRIGATION PUMPS REDUCE THE INCIDENCE OF ACUTE URINARY RETENTION IN PATIENTS UNDERGOING HIGH DOSE RATE BRACHYTHERAPY TO THE PROSTATE?

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INTRODUCTION

High dose rate (HDR) brachytherapy for men with prostate cancer has been available at the William Buckland Radiotherapy Centre (WBRC) since 1996. Our technique involves the insertion of transperineal needles, which penetrate the bladder to ensure adequate dose to the base of the prostate. A 3-way catheter is inserted at the time of the implant, and a continuous bladder washout runs until 12midnight after the needles have been removed. Routinely day 2 involves rescanning and replanning of treatment to correct for needle movement. At this time we can often see the blood collection in the bladder. Since the commencement of the program blood clots in the bladder causing acute urinary retention (AUR) have resulted in many manual bladder washouts, and numerous catheter changes. Patients have also been returned to theatre to have clots removed from the bladder.

We have discovered a catheter bag with an inline pump, which was developed by a nurse to be used with patients who have haematuria. The drainage bag has a manual pump half way between the bag and the connection to the catheter, there is also a side arm through which you can perform washouts if required. Due to the increase in cost of this catheter bag there is reluctance to stock these as a standard item within the hospital. We believe the correct use of the catheter bag will reduce the incidence of AUR caused by clots necessitating manual bladder washouts and catheter changes.

As a secondary point we will also reduce the risk of infection as there will be no need to break the sterile circuit to perform a manual bladder washout. At Alfred health annually there are twenty thousand indwelling catheters (IDC's). One thousand five hundred of these have positive urinalysis for infections per year. Infection Prevention & Healthcare Epidemiology at Alfred Health feel that one thousand two hundred (80%) of urinary tract infections annually are caused by IDC's. Although it is difficult to assess due to the number of positive urine samples and request slips do not specify who has had an IDC removed in the previous forty eight hours.

At this time no research appears to be available demonstrating the use of these bags either with HDR brachytherapy or any other urological procedure. The only information published was a cost benefit analysis performed at Como Private Hospital, Melbourne, which shows a significant cost benefit particularly in nursing hours involved with manual bladder washouts and catheter changes post trans urethral resection of the prostate (TURP).

OBJECTIVE

- To assess if the use of catheter irrigation bags with pumps will reduce the incidence of blood clots and clot retention in men being treated with HDR brachytherapy to the prostate, where the needles penetrate the bladder.
- To show no catheter associated urinary tract infections in this group of patients.

This will require developing:

- An educational program for the nurses on the ward.
- Documentation tools to record the correct use of the irrigation bags with pumps as well as the necessity of a manual bladder washout, how it was performed and the result.
- Documentation of urinalysis prior to discharge.

LITERATURE REVIEW

A literature review was performed in Medline and Cinahl using the key words of prostate cancer, high dose rate brachytherapy, side effects, blood clots, clot retention, nursing interventions.

Many articles have been published about high dose rate brachytherapy, from a medical perspective concentrating on long term outcomes. However what occurs during the inpatient stay is rarely covered or only lightly brushed over. There is minimal reference to acute side effects such as haematuria and clot retention. One exception is Whalley, 2012, who reported that significant acute toxicities include clot retention in eight of the one hundred and one patients, which is caused by the needles penetrating the bladder rather than urethral trauma.

Our department protocol is for the needles to penetrate the bladder to ensure adequate dose coverage at the base of the prostate; however this does increase haematuria and the risk of AUR caused by clot retention. When we perform our planning CT scan on day 2 we can often see the clot formation in the bladder. Issues arising post needle removal have been a concern for a number of our patients, including a small group who returned to theatre after the needles were removed to have blood clots removed from their bladder.

A continuous bladder washout (CBWO) runs from the time of needle insertion until midnight, after the needles have been removed. At the time of needle removal haematuria is expected which will settle over the rest of the day. Routinely the CWBO is turned off at midnight and the IDC is removed at 6am for a trial of void. More literature is available looking at AUR post TURP. This gives us some insight into the problem, McKinnon, 2011 reports that approximately 15% of patients who have undergone TURP at one study site have experienced AUR. McKinnon, 2011 also states that clot retention is the second most important factor in AUR. Hahn RG,

2007 also reported that 11% of the study patients after TURP had clot retention, two of which required further surgery and three readmissions.

For both HDR and post TURP the nurses need to be vigilant in accessing the patient for symptoms of AUR such as catheter bypassing, bladder discomfort or reduced drainage. The correct use of the catheter bags with irrigation pumps should reduce the incidence of AUR caused by clot retention in both groups of patients.

RELEVANCE TO UROLOGY NURSING

In this study we aim to improve the outcomes of patients undergoing HDR brachytherapy, by eliminating the need for the closed drainage system to be broken to perform manual bladder washouts, which increases the risk of urinary tract infections. The time burden on nursing staff to perform manual bladder washouts will be reduced. This study will also be relevant to patients who have haematuria and require manual bladder washouts.

METHODOLOGY

DESIGN:

- single centre
- prospective, qualitative study

PROCEDURE

- 40 sequential patients undergoing HDR brachytherapy
- Nurses in recovery and on the ward to be educated on the project requirements and documentation.
- Documentation will be completed every hour by the nursing staff during time of admission (appendix 1).
- Documentation of manual bladder washouts will specify, how they were performed (using the side arm , or complete disconnection of the system, the outcome and the length of time required (appendix 2).
- This documentation is to be completed during the patient's admission, until the IDC has been removed, and the patient discharged.
- Any variation on the plan would be notified to WBRC.
- All documentation to be returned to WBRC when the patient is discharged for data collection.
- The day 2 CT scans will be evaluated to assess if the day 2 CT scan is a predictor for clot retention.
- Results will be compared to the previous 40 patients with our standard care.
- Urinalysis to be performed prior to discharge.

STUDY SAMPLE

- 40 sequential patients admitted for HDR brachytherapy.
- All patients have signed consent forms.
- Planned dose is 17gy/2 administered on consecutive days with a single admission and implant.

INSTRUMENT

As no tool is available a form has been developed for the staff to record hourly the use of the pump as well as if manual bladder washouts were required, how they were performed and the result (appendix 1 & 2).

OUTCOME MEASURES

- Number of manual washouts required through side arm.
- Number of manual washouts where system was disconnected.
- Number of catheter changes required, and reasons.
- Number of patients who stayed longer than the expected 2 nights.

STATISTICS

Data will be evaluated using computer software Statistical Package for Social Sciences (SPSS).

FEASIBILITY

TIMETABLE

Develop project plan	October – December 2012
Develop documentation tools	October – December 2012
Educate nursing staff	February 2013
Data collection & inclusion of patients	March – December 2013
Evaluation & analysis	April – December 2013
Write up project	December 2013 – January 2014
Present at EAUN	March 2014

BUDGET

Administration	€ 300
Education resources/Printing	€ 200
Statistical costs (3 hours free of charge as per hospital protocol)	
Presentations & article writing.	€2000
Total cost	€2500

ETHICS

Approval will be sought through the Research committee at William Buckland, Nursing Research Committee and Alfred Research and Ethics committee. Patient's personal information is not required.

CONCLUSIONS/RELEVANCE

AUR caused by clots is extremely distressing for the patients and time consuming for the nurses to rectify. At the extreme the patients could be subjected to a return to theatre, and anaesthetic to have the clots removed. There is very little data on the incidence of clot retention in patients having HDR brachytherapy. This study will provide us with the information to show it is possible to reduce the rate of clot retention in HDR brachytherapy patients as well as other patients who have haematuria in a simple and cost effective way.

At the conclusion of the study we would plan to compare these results with retrospective data on 40 sequential previous patients who were treated with HDR brachytherapy with the standard catheter bags and bladder washouts.

POSSIBLE CONFLICTS OF INTEREST

None

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Tharp M, Bennett R, Burns J, et al (2007): Prostate high dose rate brachytherapy in a free-standing cancer center setting. *American journal of Clinical oncology*, 520-525

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APPENDIX 1

Time	Pump	Clots Y/N	Drainage

APPENDIX 2

MANUAL BLADDER WASHOUT			
DATE:	TIME:		DURATION:
LOCATION:	PUMP	SIDE PORT	DISCONNECTION
RESULT OF WASHOUT			
NAME/SIGNATURE	IDC CHANGED		Y /N

MANUAL BLADDER WASHOUT			
DATE:	TIME:		DURATION:
LOCATION:	PUMP	SIDE PORT	DISCONNECTION
RESULT OF WASHOUT			
NAME/SIGNATURE	IDC CHANGED		Y /N

MANUAL BLADDER WASHOUT			
DATE:	TIME:		DURATION:
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