

## Intractable Hematuria when the Chips are Down Treatment Options (Review)

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### Abstract

**Introduction:** Hematuria is the presence of blood in the urine and more than or equals to 3 red blood cells (RBCs) per high power field and intractable hematuria is recalcitrant to conventional saline bladder irrigation for treatment.

**Materials and Methods:** The literature search was done on Google Scholar, African Journal On-line (AJOL), and PubMed search engines using the words management of intractable Hematuria.

**Results:** Management of intractable hematuria includes some of the following; bladder irrigation with formalinized saline, alum irrigation, hyperbaric oxygen, Radiofrequency Ablation, sodium pentosulfan polysulfate, prostaglandins, hydrostatic distention, selective Transarterial embolization (TAE) and Palliative cystectomy.

**Conclusion:** Presence of intractable hematuria can be very frightening, disturbing, debilitating and daunting situation to address and hence the need to keep abreast with paraphernalia of maneuvers available to treat this category of patients.

**Keywords:** Hematuria; Red Blood Cells (RBCs); African Journal On-line (AJOL); Transarterial embolization (TAE)

### Introduction

Hematuria is the presence of blood in the urine called gross hematuria and more than or equals to 3 red blood cells (RBCs) per high power field is termed microscopic hematuria, it is one of the most common emergency presenting to the urologist, and intractable hematuria is recalcitrant to conventional saline bladder irrigation for treatment, which could be frightening or life threatening condition and the scenario is better imaging than experienced [1,2].

Intractable could be seen in patients with advanced bladder or prostate cancer, in severe hemorrhagic cystitis especially in patient treated with cyclophosphamide, Intravesical Bacillus Calmette-Guerin (BCG) or radiation cystitis as well as in severe infection [3-6].

Management of intractable hematuria includes some of the following; bladder irrigation with formalinized saline, alum irrigation, hyperbaric oxygen, Radiofrequency Ablation, sodium pentosulfan polysulfate, prostaglandins, hydrostatic distention, selective Transarterial embolization (TAE) and Palliative cystectomy [7-9].

### Materials and Methods

The literature search was done on Google Scholar, African Journal On-line (AJOL), and PubMed search engines using the words management of intractable Hematuria and the articles on the subject matter were reviewed, appraised and summarized, the last search was on 24<sup>th</sup> August 2019.

### Results

Management of intractable hematuria includes some of the following;

#### Formalinized saline therapy

In this procedure the patient is usually prepared by doing emergency cystogram to rule out extravasation which is contraindication to the procedure and vesico-ureteric reflux which is a relative contraindication, then an informed consent is obtained from the patient, in a lithotomy position under general or regional anesthesia a cystoscopy is performed with the aim of evacuating the blood clots then an appropriate sized Foley's catheter is inserted into the bladder with the catheter balloon inflated and full down to the bladder neck so as to prevent extravasation of the formalin into the urethra, then Formalin solution is constituted with normal saline to make up 1 - 10% formalinized saline depending on whether the patient had vesico-ureteric reflux or not, the catheter is clamped for 10 - 20 minutes after which the bladder is emptied and continuous bladder irrigation with normal saline for 24 - 48 hours [8-11].

#### Alum irrigation

This procedure entails catheterizing the patient with a wide bore 3 way urethral catheter after preparing the patient and obtaining an informed consent then the patient is catheterized with size 26F or 24F Foleys catheter to evacuate the blood clots then either aluminum ammonium sulphate or aluminum potassium sulphate is dissolved in sterile water to form a 1% solution, this can be achieved by dissolving 400 g of potash of alum in 4 Liters of hot sterile water and 300 mL of the solution subsequently added to 3 Liters of 0.9% normal saline using a sterilizing filter to form the irrigating alum solution then the bladder is irrigated with about 30 Liters of the solution of alum in 24 hours [12-14].

#### Hyperbaric oxygen therapy

The hyperbaric oxygen chamber is used to deliver 100% oxygen at 2.5 atmospheres chamber pressure for 120 minutes daily and this is continues on daily basis for the period of 28 days cycles, this can be repeated until the bleeding subsides, Hyperbaric oxygen generally increases the oxygen gradient between the damaged bladder urothelium and the surrounding tissue. It induces the healing of the tissue already damaged, as a result of that there is decrease in the edema and this subsequently promotes capillary angiogenesis by increasing tissue oxygen levels which can be as high as 10 to 15 times. The procedure is usually well tolerated without much complications [15-18].

#### Radiofrequency (RF) ablation

It is one the methods used in managing intractable hematuria after preparing the patient and obtaining an informed consent under general anesthesia or sedation, the procedure can be done percutaneously using computed tomography or Ultrasound scan guidance, and it is performed with the help of Radionics Cool-Tip 200-W RF ablation Radiofrequency Ablation system, however the remaining procedure is usually performed with Ultrasound guidance then after the procedure a check Computed tomography scan can be done [19-21].

#### Sodium pentosan polysulphate

This entails the use of 100mg of oral sodium pentosan polysulphate which is given three times daily it can be used in patients with chronic gross hematuria post radiation, it takes about four weeks or more to achieve control of bleeding sodium Pentosan polysulphate maybe controlling hematuria by increasing the natural defence of the bladder-urine interface as a result of that it coats the bladder urothelium, which is usually damaged by radiation, since oral sodium pentosan polysulphate does not have known anticoagulant activity, it is considered safe and less likely to be toxic [22,23].

#### Prostaglandins

This procedure involves the use of Prostaglandins PGE1, E2 and F2a intravesically to treat Intractable hematuria resulting from cyclophosphamide induced hemorrhagic cystitis, it is postulated to provide a cytoprotective function, through regulating a mucous barrier and

this leads to platelet aggregation which will induce vasoconstriction with consequent mucosal and submucosal vascular smooth muscle vasoconstriction. Some of the examples of prostaglandins used are Misoprostol and Carboprost tromethamine, the patient is prepared an informed consent obtained then catheterized and clots are evacuated then 0.4 to 1.0 mg. % or 0.8 to 1.0 mg. % carboprost tromethamine depending on the protocol used is instilled into the bladder 2 hourly 4 times daily, alternating with Normal Saline bladder irrigation for 2 hours and the catheter is removed [24-27].

### Hydrostatic distention

This procedure involves the use of special designed balloon or condom to create an Intravesical pressure enough to cause tamponade of the bleeding vessels, the patient is prepared an informed consent obtained under epidural anesthesia, the patient is catheterized with the special designed balloon catheter and the balloon is inflated with normal saline and a transducer is attached to the catheter to measure the pressure, then the balloon pressure is increased until it reaches the systolic blood pressure of the patient or 10 - 20 cmH<sub>2</sub>O higher than the patients diastolic blood pressure and maintained for 6 -7 hours before it is removed [28-30].

### Transarterial embolisation (TAE)

This is a form of an Interventional Radiology were the patient is prepared and selective angiography is done to determine the bleeding vessels then bilateral transarterial therapeutic embolization is achieved by occluding the anterior division of internal iliac artery, the superior and inferior vesical arteries, the superior and inferior vesical arteries with blood clot, a piece of muscle, polyvinyl alcohol particles, Tachotop, Gelfoam, metallic coils or isobutyl-2-cyanoacrylate, usually a coaxial catheter technique over a hydrophilic guide wire with 0.64 mm and 0.89 mm coils using about 2.5 or 5 cm length the selected artery is embolized and check angiography is performed to ensure completeness [31-35].

### Palliative cystectomy

This is usually done as the last resort in the management of intractable hematuria in some patients with advanced bladder cancer whom radical cystectomy aiming at cure is not possible, but the patient is having intractable hematuria however palliative cystectomy is losing popularity as a result of the availability of effective neoadjuvant chemotherapeutic agents [36].

### Conclusion

Presence of intractable hematuria can be very frightening, disturbing, debilitating and daunting situation to address and hence the need to keep abreast with paraphernalia of maneuvers available to treat this category of patients.

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