MEditorial August 2012

"The Red Sea"

The actual Red Sea, between North Africa and the Arabian Peninsula, an extension of the Indian Ocean, has important geopolitical, economic/commercial and religious connotations. The origin of its name is controversial and may be more of a linguistic malapropism. There is a seasonal reddish plant that grows near the water's surface. As far as I know, its name has nothing to do with blood [or the spilling thereof from those "warring" factions connecting to it historically].

As urologists, we not infrequently encounter "red sea" situations where there is **significant bleeding** (hemorrhaging) from the urinary tract. Associated with significant bleeding is the formation of clots which are hard to pass, even more so in someone with a narrowed urethra, e.g., prostate obstruction. An emergency (often painful) situation can transpire with the need for transfusion of blood products, cardiovascular instability/shock, urgent surgery, and rarely death.

Bleeding implies open blood vessels. Reasons can include trauma, urinary tract cancer, stones, as well as infections and related inflammations. Abnormal "benign" prostate tissue often has very fragile blood vessels below the surface that can open up with no obvious or minimal provocation [such as sneezing hard or lifting something heavy]. The blood vessels that feed the urinary tract organs can be defective themselves. This can be seen after pelvic radiation, where the small veins in the wall of the bladder become more prominent and fragile ("telangectasias"), and are closer to the surface, which has been thinned out by the radiation treatment, even given years before. Arteriovenous malformations (AVM's) and pseudo-aneurysms (these can be congenital or acquired--and may evolve with certain disease states or after the urologist's cutting surgery into the kidney or the interventional radiologist passing a tube into the kidney to obtain better urinary drainage) often affecting the kidney, can suddenly open up and hemorrhage. Benign growths in the kidney, called angiomyolipomas, have abnormal blood vessels with poorly formed vascular walls and can bleed significantly into the urinary tract or into the space around the kidney, especially when they reach a size of larger than 2.5 inches.

What should you think about when you see very red urine? Besides the usual admonitions to stay calm, realize that whatever the cause, the gross bleeding may well stop on its own. Some prudent "medical" first aid helpful moves are to rest; avoid straining to have a bowel movement or lifting; make sure your blood pressure is not too high; and [perhaps] most importantly, stop anticoagulant medicines, if you take these. Such drugs include but are not limited to: low-dose ("baby") and regular aspirin, Plavix, Pradaxa and Coumadin (warfarin). Some feel the ibuprofen and related drugs also have an anticoagulation effect, albeit lesser than the others mentioned. You and your general doctor, internist or cardiologist should have a good reason that you take blood thinners, but staying on these in the face of acute hemorrhage is unwise—and can make urological procedures to stop bleeding more risky and less effective. In most cases, cardiologists are OK with stopping anticoagulants in the face of urinary hemorrhage; and the cardiovascular risk from being off these for a matter of a week or two is low. I think it's reasonable to stop these right away and at the same time contact the prescribing physician to be sure the reason underlying this temporary change is discussed. Note each anticoagulant medicine has

a different time span to be eliminated from the body, to the extent that it will no longer effect the "coagulation cascade"; also some but not all the anticoagulants have what amounts to antidotes that can be effective if used when hemorrhage is significant.

Our approach to stopping bleeding depends on what we think is causing it, the degree of blood loss, whether or not the individual can pass urine, and other factors such as the degree of pain in the bladder and/or kidneys and the patient's vital signs (stable versus unstable). Placing a urinary catheter in the office or ER can sometimes help--especially if the patient cannot eliminate urine spontaneously or if the hemorrhage is soon after transurethral surgery for bladder cancer or prostate enlargement. Theory here is that the distended bladder "pulls" on the cut surfaces (including lining of the urinary tract and underlying blood vessels), not allowing them to come together and seal off. Placing a urinary catheter and manually irrigating out most if not all clots will often provide relief from bladder distention--if not put an end to the oozing. In general, a bladder catheter placed just for bleeding without bladder distention will not control hemorrhage. A catheter through which blood clots cannot be irrigated (sometimes one of too narrow a caliber) will also be ineffective.

Approaches to major bleeding usually involve a preliminary x-ray of the entire GU tract from kidneys to bladder; a so-called CTU (CT Urogram) is one of the best options. Next would be a cystoscopy (look with 'scope into bladder). In cases with major bleeding, that is better done in the operating room under anesthesia, so that a more rigid/larger instrument can be comfortably used—that also allows clots likely present in the bladder to be irrigated. Many pathologies that cause hemorrhage can be approached cystoscopically: for example, resection of bleeding prostate tissue or bladder cancer, or laser treatment of a smaller bladder cancer or even a growth in the ureter (tube from bladder to kidney) or the inside membranes of the kidneys themselves.

Open or laparoscopic surgery may be needed to remove part or all of a diseased urinary organ [such as a kidney or the bladder], occasionally on an urgent basis, for life-threatening hemorrhage.

The interventional radiologist is increasingly important in assisting us to control bleeding, since blood vessels can be intentionally occluded from within the vascular system, e.g., bleeding areas from the kidney and bladder can be detected and sealed by placing a catheter by way of a groin artery and aorta into the aortic branches feeding the appropriate part of the urinary tract.

Here are some interesting recent examples, in my practice, of controlling major GU bleeding. An older man bled repeatedly and needed hospitalization for anemia/transfusions secondary to remote prostate cancer radiation and so-called "hemorrhagic radiation cystitis". He failed multiple attempts to electrically and laser-cauterize bladder vessels with the cystoscope; and well as chemicals such as silver nitrate and potassium aluminum sulfate (alum) instilled into the bladder to nonspecifically cauterize its entire surface. He had 40 "daily" hyperbaric oxygen treatments to help improve the integrity of the bladder damaged by "oxidative stress" (so-called "free radicals") from his curative radiation. I finally asked the Interventional radiologist to do two things: (1) embolize blood vessels leading to that portion of the bladder which was hemorrhaging; and (2) divert the urine away from the bladder using externalized kidney tubes (percutaneous nephrostomies) to "place the bladder at rest". While the

bladder was at rest, receiving very minimal urine from the kidneys, patient had a 2nd course of hyperbaric oxygen which, thus, far has helped tremendously and which I feel will work better in the long haul than the 1st course of HBO--due to the concurrent interventions. Patient's tubes are all out and he is voiding fine, yellow urine.

Another example of a cross-disciplinary approach follows. A man already with chronic renal failure, on hemodialysis, had major hemorrhaging traced cystoscopically to be coming only from left ureter/kidney. Attempts to visualize/diagnose/treat the offending bleeder were thwarted and unsuccessful, since there was poor visualization of the inside of the kidney with the flexible uretero-pyeloscope (skinny telescopic instrument to look at urinary tract above the bladder). Patient was taken by interventional radiologist to angiography (radiographic study of blood vessels) and had a "selective" left renal angiogram. This showed a previously unknown arteriovenous malformation (a cluster of thin-walled abnormal blood vessels fed by several branch arteries). The radiologist was able to occlude several visibly bleeding vessels with an excellent outcome--this in fact improved renal function, since the left kidney, previously backed up with clots, was now able to function and excrete its load of urine better.

Turning the "red sea" into the "yellow sea" is highly gratifying for me as a urologist. My patients need not worry that their life is in danger, even with the most egregious cases of urinary tract hemorrhage.


## Dr. Alan Freedman

## 401 Old Newport Blvd., Suite 101

## Newport Beach, CA 92663

## Phone: (949) 645-3434

## FAX: (949) 645-0277