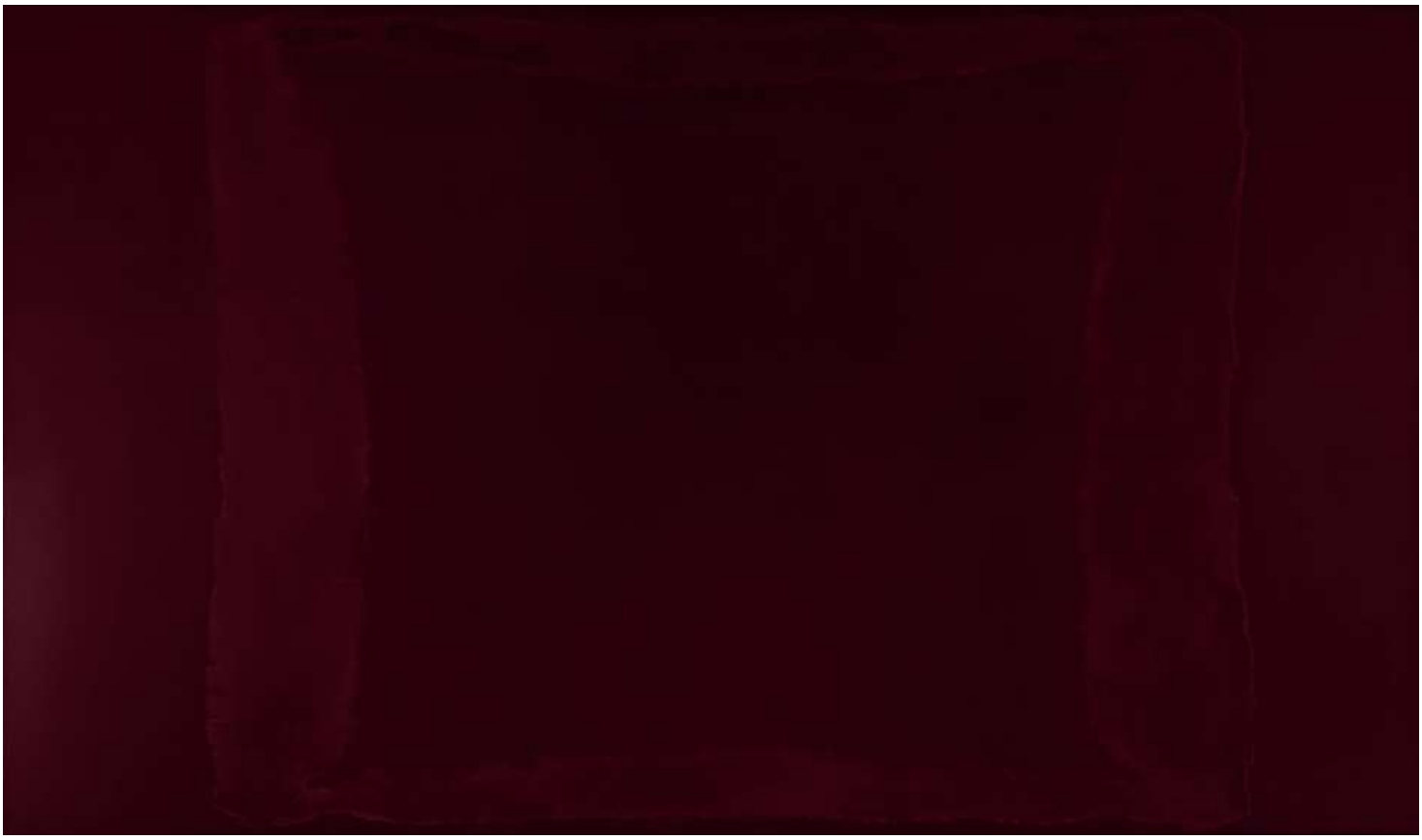
THE NORTHERN HOSPITAL

THE ONCOLOGY PATIENT WITH RENAL IMPAIRMENT



"Red on Maroon", Seagram Mural (Section 2), oil on canvas, 1959, Tate Gallery London.

"Just how powerful is art? Can it put you off your food the way love or grief or fear does? Can it slam the breaks on the relentless business of life, fade out the buzz and cut straight through to our most basic emotions: anguish, desire, ecstasy, terror?

For most of art's history, it was assumed that if you pitched the stakes that high you would need stories, or at least figures, to deliver the poetic rush of feeling: weeping madonnas, voluptuously vulnerable nudes, soulful self-portraits, embattled heroes laid low. Even figureless landscapes drenched in light worked through the presumption of sentimental memory, briefly passing felicities.

But Mark Rothko believed that tradition was all used up; that figurative art no longer had what it took to connect us viscerally, to the human tragedy. In the century of mass incinerations, who cared about a few darts in the side of St. Sebastian? The problem of modern life, especially in consumer society, he thought, was that unspeakable things had been done and contemporary culture's answer was to dull the pain with distraction, with the daily satisfaction of the appetites. The problem of modern art was how - with such

elementary materials as paint and canvas - it could throttle the relentless chirpiness of contemporary life and reconnect us with the strenuous drama of the human condition. The triumph of the photographic image only compounded the problem, since the equation of the optimally fixed image with reality had made us more impervious to the deeper truths of experience. Only a completely new visual language of strong feeling, Rothko thought, could wake us from moral stupor. So he set himself - and New York - a test.

*In 1958 Rothko took on a commission through which, he could bring his monumental dramas right into the belly of the beast. The Canadian distilling company Seagram's wanted the best modern art to compliment the elegant modernist space of the Four Seasons, the restaurant located on the ground floor of their corporate headquarters in mid-town Manhattan. Rothko's work would join paintings by Picasso and Jackson Pollock. So he accepted the commission, but rather in the manner of a duelist picking up a flung glove. He understood well enough what he was up against, fashion, glitter. But that was the point. He was at the top of his game, and if it was haute cuisine against high art - **his** high art, at any rate - the truffled soles didn't stand a chance. Whether or not they knew what they were in for when the linen napkins dropped on their laps, the diners would be transformed by the paintings surrounding them. Between the consommé and the coffee they would be pulled deep into the Human Tragedy."*

"The Music of Beyond in the City of Glitter", in "Power of Art",
Simon Schama, BBC, 2006.

But as the magisterial art commentator Simon Schama pointed out, "things didn't quite work out that way!" In 1957 Mark Rothko was at the height of his powers and popularity, even though many struggled to understand him. He resisted all attempts to classify his startling works, most usually as an "abstract expressionist". So exasperated did he become at people demanding "explanations" of his works, he simply ceased trying to explain them at all, merely commenting to pushy journalists, "silence is so accurate!".

*Today Rothko is most commonly described as a "Colour Field" painter, a sub-genre of "Abstract Expressionism", which at the height of its popularity in the 1950s and 60s was described as an art form that included nothing intentionally representational from the real world. It took the next step from "Impressionism". Paintings were created not to give an "impression" of the real world, or for anything in particular for that matter, but rather to induce an intense feeling or emotion. The "action painters", such as Jackson Pollock, created works of angry energy. The colour field painters, such as Mark Rothko, on the other hand, created more passive works, that would draw or invite the viewer into it, rather than to virtually assault the viewer as appeared to be the case for the action painters. In the post Second World War world traditional art forms did not seem capable of describing the human condition, in Schama's words, "in an age of mass incinerations who cared about a few darts in the side of St Sebastian?" A new art form was needed to convey intense emotional experiences. Rothko himself said, "I'm not an abstract artist; I'm only interested in expressing human emotions". With respect to Rothko in particular - it wasn't just a matter of looking at the work. **How, where** and even **when** the works were to be displayed were all critically important factors in appreciating the works! To Rothko, even the response of the viewer was a part of the work. If viewers rejected or misunderstood his work, he felt it would wither and die, if they embraced it and*

appreciated it he felt it would grow and evolve! The viewer themselves therefore were also an integral part of the work!

Rothko's paintings were to ***simply*** *express complex, but universal visceral emotions and feelings, - tranquility, peace, anxiety, anger, rage, love, grief, reflection, poignancy, nostalgia, memories, déjà vu, joy and so on. But different responses could be induced in different people. In an interview with a journalist in 1957 he said: "I am not an abstractionist…I am not interested in the relationship of colour or form or anything else… I'm interested only in expressing basic human emotions - tragedy, ecstasy, doom and so on - and the fact that a lot of people break down and cry when confronted with my pictures show that I communicate those basic human emotions…The people who weep before my pictures are having the same religious experience I had when I painted them. And if you, as you say, are moved only by their color relationships, then you miss the point!" Rothko insisted that his works be displayed in muted light to promote less distraction from the surroundings. The color fields would almost pulsate; like, in Simon Schama's words, some giant animated biological valve. Many works were done on a vast scale, in order to minimize the influence of the distractions of the surrounding world. Murals would be placed around a space in order to literally engulf the viewer. There were no frames, to artificially divide the painting from its surrounding environment or to separate itself from the viewer. This was to draw the viewer into its inner world, so that the viewer became a part of the painting itself. Schama describes his first viewing of a Rothko work: "The longer I stared, the more powerful was the magnetic pull through the black columnar forms towards the interior of Rothko's world. I still wasn't sure it was somewhere I wanted to be; only that by some sorcery of vision I had no choice but to go on. And that the destination might not prove to be a picnic." Few or even only one color would be used, to minimize conflicting influences. Colours would subtly merge at vague borders. Complex emotions were simplified into their purest form. There were no focal, reference or perspective points. All parts of the canvas were equally important. Colours were largely evenly distributed, in order not to create any false impressions of objects, landscapes, or any objects within the real world. The painting was a work of and for the inner mind. The painting spoke to each individual viewer, and said different things to different people.*

In June of 1959, Rothko, after nearly two years of work on the Seagram commission, took his wife Mell to dine at the newly opened and highly glamorous Four Seasons restaurant. For someone who thought that it was immoral to spend more than five bucks on a meal - the experience came as quite a shock! After the meal, he raged to a friend, "Anyone who will eat that kind of food for that kind of money will never look at a painting of mine!" The next morning, he withdrew from his commission to the Seagram murals and handed back the money! Haute cuisine had won out against high art. In 1970 Mark Rothko committed suicide. His works of course were never displayed at The Four Seasons, but today can be viewed by everyone - for free- at the Tate gallery, London.

If Rothko bequeathed anything to the world, it was the importance of ***"context".*** *Rather than have his works displayed in an inappropriate setting, he rejected a multi-million dollar commission! When we assess any cancer patient who presents in renal failure, we must be aware of the critical importance of context! We need to consider the specific renal complications associated with malignant disease and its treatment.*

THE ONCOLOGY PATIENT WITH RENAL IMPAIRMENT

Introduction

Renal impairment / failure is a significant complication that frequently afflicts patients with malignant disease.

It causes substantial morbidity and mortality in cancer patients and can substantially jeopardize the chances of cancer patients receiving optimal treatment and potential cures.

As with any oncology patient there should be close consultation / communication with the treating oncologist

Oncology patients can develop renal impairment for any of the reasons that non-oncology patients can.

There are however a number of additional specific important considerations in the oncology patient who presents with renal impairment.

The most important oncological considerations will include:

Pre-renal:

- Blood loss
- Dehydration
- Sepsis

Renal:

- Renal toxic drugs
- The tumour lysis syndrome
- Light chain disease, (multiple myeloma)
- Hepatorenal syndrome
- Amyloidosis

Post renal:

- Obstructive uropathy from tumor mass

It is vital to assess any cancer patient who presents with renal impairment in the additional context of their malignant disease, where important malignant related pathologies need to be specifically considered.

Pathology

Of particular concern in the oncology patient who presents with renal impairment will be the following conditions:

1. Dehydration:
    - Nausea and vomiting in patients receiving radiotherapy or chemotherapy.
    - Hypercalcemia:
        - ♥ This can result in nausea and vomiting.
    - Steroid induced hyperglycaemia
        - ♥ Resulting in osmotic urinary losses
2. Sepsis:
    - From immunosuppression, due to the cancer, and/ or its treatment
    - **This constitutes one of the most common causes.**
3. Hypercalcemia:
    - Nephrocalcinosis can result in nephrogenic DI with consequent polyuria and polydipsia
    - Hypercalcemia is particularly associated with multiple myeloma, breast, renal (particularly clear cell) and lung (particularly squamous cell) carcinomas. Note prostate carcinoma is *not* a common cause of hypercalcemia.
4. Malignant obstructive uropathy:
    - Malignant disease involving the abdomen and/ or pelvis may lead to bilateral ureteric obstruction and a consequent obstructive uropathy.
    - Postrenal causes of ARF in cancer patients are far more common than in the general population and should always be considered. Obstruction may occur at *any* level of the renal tract.
5. Therapeutic complications:

    Chemotherapeutic drugs:

    - In addition to causing nausea and vomiting, some chemotherapeutic agents may also result in direct renal toxicity.

- Many antineoplastic drugs have been strongly associated with renal impairment, commonly due to a thrombotic microangiopathic mechanism.

  The most commonly implicated agent is **cisplatin.**

  Less commonly a large number of other agents have been implicated, including **mitomycin C, bleomycin,, gemcitabine, methotrexate, ifosfamide** and **5-fluorouracil,** but there are also many others.

  Bisphosphonates are antiresorptive agents that are widely prescribed to treat osteolytic metastases and hypercalcemia of malignancy. There are some reports that on occasions they may induce renal toxicity presenting a nephrotic syndrome. [1]

Radiotherapy:

- Rarely local radiotherapy may induce retroperitoneal fibrosis and consequent ureteric obstruction.

6. Tumor lysis syndrome:

   - Renal impairment from both hyperuricemia and hypercalcemia.

   - **There should always be a high index of suspicion for this condition in oncology patients.**

   See also separate guidelines on Tumour Lysis Syndrome.

7. Post hematopoietic cell (i.e. bone marrow) transplant:

   - The mechanism of renal failure in this setting appears to be multifactorial, but includes a form of hepatorenal syndrome known as *Sinusoidal obstruction syndrome (SOS)* and tumour lysis syndrome. [1, 3]

Less commonly:

8. Vascular related complications:

   - Renal vein thrombosis

   - Disseminated intravascular coagulation.

   - Intrinsic microvascular thrombosis, (or thrombotic microangiopathy or **TMA**).

     TMA may be associated with the cancer itself, with cancer chemotherapy, or with allogeneic bone marrow transplants. [3]

9. Amyloidosis:

    - Most commonly in association with multiple myeloma.

10. Paraneoplastic glomerulonephropathies.

11. Direct malignant invasion:

    - Although many solid and hematologic cancers can directly invade the renal parenchyma, consequent clinical sequelae directly attributable to this cause are usually not prominent.

    - Parenchymal replacement usually has to be very extensive before renal impairment occurs.

Clinical Assessment

In general terms:

Important points of history:

1. Establish the nature of the malignancy

2. Establish the stage of the malignancy

3. Establish the patient's current functional status, (the **ECOG Performance Scale** is commonly used for cancer patients, in this regard).

4. Current cancer treatment:

    - Enquire into current cancer treatments, including chemotherapy, radiotherapy or immunotherapy.

5. Are there any documented:

    - **"Limitation of medical treatment plans"**

    - "**Advanced care plans**"?

6. Is the patient under the care of a **palliative care program**?

Important points of examination:

1. Vital signs:

    As for any patient assess the vital signs.

    - The presence of **fever** must always prompt consideration of **febrile neutropenia**, **(see separate guidelines).**

2. Assess the GCS / conscious state.

3. Assess for dehydration:

Investigations

Considerations will include:

Blood tests:

1. FBE
2. U&Es/ glucose
3. Serum calcium and phosphate levels
4. Uric acid levels:
    - Tumour lysis syndrome

Others as clinically indicated:

5. ABGs (or venous blood gases):
    - Principally to assess degree of acidosis
6. LFTs
    - Where hepato-renal syndromes are suspected.

Urine:

- FWT:
    - ♥ Check for proteinuria/ nephrotic syndrome
- Microscopy:
    - ♥ For bacteria or casts indicating intrinsic glomerular disease.
- Culture

Radiology:

CXR, if chest infection or pulmonary edema is suspected.

Ultrasound:

This is a critical initial screen for obstructive lesions of the renal tracts, and in most cases will need to be an **urgent** investigation in oncology patients in whom this condition is suspected, (or needs to rule out).

Note however that **early** in some disease processes, obstructive uropathy may still exist even without obvious hydronephrosis, when the collecting system is encased in retroperitoneal fibrosis or tumour or when the obstruction is partial. [3]

CT scan:

CT scan can be a useful screening modality for the abdomen and pelvis for mass lesions which may be causing obstruction, but IV contrast make the investigation problematic.

MRI:

MRI becomes a relatively more important investigation for oncology patients with renal impairment or failure, where avoidance of IV contrast is a consideration.

Management

Early recognition and treatment of renal failure is vital in cancer patients - both to improve renal outcomes and to ensure that that patients are best prepared for any further oncologic treatment.

Management will involve the treatment of the usual symptoms and complications of renal failure, but will also need to address any particular underlying pathology precipitated by the cancer itself.

As for any case of ARF, priorities will include:

- Urgent correction of life threatening hyperkalemia, **(see separate guidelines on hyperkalemia)**
- Rehydration, where clinically indicated.
- Dialysis replacement therapy

See also separate Acute Renal Failure Guidelines.

Specific treatments must also be undertaken when a cancer related pathology is present, such as:

- Surgical relief of obstructive lesions
- Treatment of hypercalcemia
- Treatment of the tumour lysis syndrome

The aggressiveness of treatment will depend on each individual case, and so broad generalizations are not possible.

Important factors which will come into consideration will include:

- The immediate prognosis of the patient with respect to their cancer.
- The functional status of the patient, (often assessed via the ECOG Performance Status Scale).
- The presence of significant co-morbidities
- The wishes of the patient themselves and/ or guardians.
- The pre-existence of limitation of medical treatment or advanced care plans.

Disposition

Cancer patients who develop renal impairment or failure represent complex medical cases.

A *multidisciplinary* approach is usually needed to ensure adequate assessment, appropriate preventative measures and early intervention to reduce the incidence of life-threatening acute renal failure in cancer patients.

As with any oncology patient there should be close consultation / communication with the treating oncologist

Additional specialities will often also frequently need to be involved in the planning of treatment, and these may include:

- Haematology
- Nephrology
- Urology
- ICU
- Palliative care teams.
- The patient's primary care giver physician

Above: The Four Seasons Restaurant, New York City, 1959.

Left: Maroon on Black, oil on canvas, Mark Rothko, Tate Gallery, London.

References

1. Humphreys B.D et al. Renal Failure Associated with Cancer and Its Treatment: An Update J Am Soc Nephrol 16: 151–161, 2005. doi: 10.1681/ASN.2004100843

2. Lameire N.H et al. Acute renal failure in cancer patients. Annals of Medicine, 2005; 37: 13-25.

3. Darmon M et al. Clinical review: Specific aspects of acute renal failure in cancer patients. Critical Care 2006, 10:211 (doi: 10.1186/cc4907).

Dr J Hayes.
Dr Shane White, Chief Oncologist Northern Hospital

February 2012