Midlands Trauma Networks
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Author: Midlands Trauma Networks
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Contact details for further information: Midlands Critical Care, Trauma and Burns Networks 15 Frederick Road Birmingham B15 1JD
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Purpose

To provide evidence based information regarding indications for Interventional Radiology and the referral pathway.

Scope

This is an overarching guideline for use by our Major Trauma Centres, Trauma Units and Local Emergency Hospitals to use in its entirety or to aid further development of localised guidelines as required.

Introduction

Interventional radiology (IR) has an increasing role in the management of major haemorrhage in the multiply injured patient. Major trauma centres (MTC) have provision for interventional radiology with 24/7 consultant lead on-call service and is carried out in specialised endovascular theatres with high quality imaging and a wide range of appropriate consumables. Patients will typically be transferred with full anaesthetic support and the theatre will have equivalent facilities to an operating room. IR is complementary to damage control surgery and both may be required. On this basis, any patient that may require surgery and IR should be transferred to the nearest MTC so that all options for treatment are available.

On the basis of CT findings and the clinical status of the patient, a decision can be made regarding non-operative management (NOM), IR or damage control surgery (DCS). This decision is typically made after discussion between the trauma team leader, trauma surgeon and interventional radiologist.

Principles

Indications for IR

Interventional radiology is most useful for stopping arterial haemorrhage in the trauma patient. Good quality imaging is essential for the diagnosis of major haemorrhage and planning potential intervention. Dual phase contrast enhanced CT is recommended in the first instance. This is usually able to identify the cause of haemorrhage and determine if it is treatable with endovascular therapy. Occasionally, it is not possible to determine if the bleeding is arterial or venous and in such circumstances, a conventional triple phase CT scan is recommended.

Techniques involve embolization of bleeding arteries, embolization of false aneurysms to prevent secondary haemorrhage, and deploying stent grafts to maintain flow in the injured vessel. In addition, IR can offer techniques that preserve as much parenchyma when treating haemorrhage from injuries to solid organs such as the spleen, liver and kidneys.

Aorta

Patients with thoracic aortic injury distal to the left subclavian artery should be considered for endovascular stent grafting. Intimal tears may be treated with observation. Patients with abdominal aortic injury below the level of the renal arteries should be considered for endovascular stent grafting or surgery.

All patients with aortic injuries should be discussed with the MTC with a view to transfer for definitive management. Discussion regarding management will involve the trauma team leader, vascular or cardiothoracic surgeons and interventional radiology (depending on local protocol).

Spleen

Active extravasation of contrast or false aneurysm are indications for endovascular embolization particularly in higher grade injuries. This has the advantage over surgery (splenectomy) of preserving splenic immune function even if proximal splenic artery embolization is necessary.

Patients with splenic injury should be discussed with the TTL who can review imaging with the interventional radiologist and surgeon to determine management. After decision to treat, the patient should be transferred to the MTC for definitive management.

Liver

Liver injury with active extravasation of contrast or false aneurysm should be considered for embolization. In addition, patients with ongoing haemorrhage following DCS can also be considered for embolization.

Patients with liver injury should be discussed with the TTL who can review imaging with the interventional radiologist and surgeon to determine management. After decision to treat, the patient should be transferred to the MTC for definitive management.

Kidney

Embolisation should be considered to treat active bleeding or false aneurysm. Primary objective is to control haemorrhage and try to preserve renal parenchyma if possible. Injury to the collecting system and ureter may also be considered for IR insertion of nephrostomy or ureteric stent.

Patients with renal trauma should be discussed with the TTL who can review imaging with the interventional radiologist and urologist to determine management. After decision to treat, the patient should be transferred to the MTC for definitive management.

Pelvis

Embolisation should be considered in patients with evidence of active arterial bleeding or false aneurysm on CT. Haemodynamically unstable patients following pelvic fixation should also be considered for embolization.

Patients with pelvic bleeding should be discussed with the TTL who can review imaging with the interventional radiologist and orthopaedic surgeon to determine management. After decision to treat, the patient should be transferred to the MTC for definitive management.

Referral pathway

Patient should have had CT evidence of vascular or solid organ injury with evidence of haemorrhage.

Images should be transferred to the MTC for review.

Discussion should take place with the TTL in the first instance who may then coordinate discussion between IR and other surgical specialities to decide management and arrange transfer if indicated.

Once the patient arrives, they will be assessed by the TTL in ED before transfer to IR for treatment.

It may be necessary to re-image the patient after transfer to MTC if the patients clinical condition has changed.

References:

The Royal College of Radiologists. Standards of Practice and Guidance for Trauma Radiology in Severely Injured Patients. London: The Royal College of Radiologists, 2011

CIRSE Guidelines: Quality Improvement Guidelines for Endovascular Treatment of Traumatic Haemorrhage. Cardiovasc Intervent Radiol 2012 Jun; 35(3): 472-8