Minimally Invasive Interventional Radiology in Palliative Care

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Declaration of Conflict of Interest

• All the authors have no conflict of interest to declare
Objectives

• Review the role of minimally invasive interventional radiology procedures in palliative care
• Understand common mechanisms of cancer pain
• Review the role of imaging in determining choice of potentially helpful interventional technique
Palliative Care

- Unrelieved pain is the greatest fear amongst dying patients
- Uncontrolled pain causes anxiety
- Anxiety intensifies pain experience
- Pain control is a high priority in palliative care

Pain Control

- Most cancer patients achieve pain control following the World Health Organization’s three step ladder $^{1,2}$

Step 4 for non-responders

MIPCC

- Minimally Invasive Palliative Procedures Conference (MIPPC) was created at BC Cancer Agency to facilitate access to MIPPs
- Fortnightly
- Multi-disciplinary

Teaching Point

A videoconference allows remote sites to refer patients and actively participate as local expertise may be unavailable to perform these palliative procedures

- Province wide participation
Image guided procedures

• Oncologists and palliative care physicians may be unaware of the scope and range of MIPPs available:
  – Nerve block and nerve root ablation
  – Epidural injections
  – Plexus blocks (celiac, ganglion impar, stellate)
  – Thermal ablation (cryoablation, radiofrequency, microwave)
  – Cementoplasty (vertebroplasty, acetabuloplasty, sacroplasty, ilioplasty)
  – Embolization
Multidisciplinary collaboration

Teaching Point
The goal is to treat the specific lesion responsible for the patient’s symptoms.

MIPPC Referral Form
Minimally Invasive Palliative Procedures Conference

Learning Objectives
Palliative Care
WHO 3 Step Ladder
Step 4
MIPCC
Cancer Pain
Choice of Intervention
Case 1
Case 2
Case 3
Conclusion
Post MIPC follow-up

- For most procedures, follow-up is provided by the referring physician within two weeks of the procedure.
- Contact details of the performing radiologist and radiology department are given to all patients.
- Radiofrequency and cryoablation procedures are followed up with MRI (+Gd) at four weeks.
- If the patients present sooner with pain, CT is often adequate to troubleshoot major complications.
- Attempts are made to fast-track patients who re-preset with symptoms for evaluation and potential re-treatment.
Cancer-Induced Bone Pain

Teaching Point
Complex pain state involving:
(1) Background pain – dull continuous pain increases in intensity as disease progresses and treated successfully with conventional analgesics
(2) Spontaneous and incident (movement-evoked) known as breakthrough pain, are rapid onset and short duration intermittent episodes of extreme pain breaking through analgesics used to control background pain

Choice of intervention

- Neuropathic pain results from cancer-induced damage to sensory nerves caused by infiltration and/or compression by tumor cells, tumor-induced hyperinnervation and stretching or denervation as the bone expands and degrades.

Teaching Point
CT or MRI can determine if a nerve is compressed or infiltrated by tumor.
Choice of intervention

- Cementoplasty consolidates weight-bearing bone and treats pain on weight-bearing caused by tumors or associated pathological fractures in these bones, such as the pelvis.
- Thermal ablation using cryoablation or radiofrequency is used for tumor volume reduction or if soft tissue extension needs to be treated.

Presentation

- 51 year old man with metastatic rectal adenocarcinoma
- Refractory to chemotherapy and radiation
- Pain to right pelvis and hip
Cryoablation and Ilioplasty

Learning Objectives
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Outcome

Learning Objectives

Palliative Care

WHO 3 Step Ladder

Step 4

MIPCC

Cancer Pain

Choice of Intervention

Case 1

Case 2

Case 3

Conclusion

2 months pre-procedure

Severe pain

3 months post-procedure

Complete pain relief

6 months post-procedure

Mild pain

(new tumor in ilium)
Presentation

- 52 year old man - competitive dirt bike racer presents with progressive pain in right hip on weight bearing
- Core biopsy:

- Primary osteosarcoma or malignant fibrous histiocytoma (high grade pleomorphic undifferentiated sarcoma)
- Bilateral pulmonary metastases
One of the advantages of cryoablation is the predictable ablation zone (depending on the probe) and the ability to clearly delineate the ablation zone.
Cryoablation

Axial T1 FS + Gad

Hypodense ablation zones
Teaching Point
Cementoplasty in a weight-bearing bone improve osseous compressive strength
Teaching Point

Combined techniques (such as thermal ablation with cementoplasty) may have synergistic effect on pain relief, especially for bulky tumors with extraosseous extension.

89 year old man with metastatic prostate cancer.

Left THR and severe left hip pain
Technique
Step 4
MIPCC
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First acetabuloplasty
15 cc of PMMA
Partial pain relief
Pain worse 2 months later

Second acetabuloplasty
35 cc of PMMA
Complete pain relief
CONCLUSION

- Conventional analgesia remains the mainstay of palliative pain management
- A subset of palliative cancer patients who does not respond to conventional analgesia benefit from minimally invasive interventional radiology procedures
- A multidisciplinary case conference (MIPCC) made a significant impact on the course of management of these non-responders