Clinical Guide For The Management Of Neurosurgical Patients During The COVID-19 Pandemic

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As the COVID-19 pandemic sweeps across the world, it has become clear that doctors in all specialties need to adapt and change the way they work. As neurosurgeons we need to adapt our working practices to ensure the following goals:

1. That we still continue to provide an appropriate standard of care to our patients with neurosurgical conditions. The standard of care may need to be modified given the unprecedented circumstances.
2. That we minimise the risk of spread of COVID-19 virus amongst our patient population. Neurosurgical patients are a vulnerable group of patients with major neurological diseases. If they become infected with COVID-19 in the perioperative period, they are highly likely to have very poor outcomes. Therefore during the COVID-19 pandemic, neurosurgical procedures should be performed only in those patients who are at high risk of death or major disability if they are not treated (e.g. hemiplegia, blindness …)
3. That we minimise the risk of spread of COVID-19 virus to healthcare professionals. The experience in China, Italy, Iran and Spain has clearly demonstrated that one of the most at risk groups are healthcare professionals. As a result, one of the most devastating effects of the COVID-19 pandemic is the ever decreasing number of available healthcare professionals within the health service (due to active infection, close contact with those who are infected, or death), ultimately resulting in the collapse of the health service. It is our responsibility to ensure that Ireland holds on to as many healthcare professionals as possible to be able to fight this pandemic.

The following is a guide to assist neurosurgeons in managing neurosurgical patients in Ireland during the COVID-19 pandemic. It must be noted that these are guidelines, and it is not possible to cover all possible scenarios. The decision making in individual cases will rest with the consultant in charge who will take into account the usual prognostic factors (such as patient's condition, age, comorbidities) but also available resources during the pandemic and the risks of possible COVID-19 infection for the patient, other patients, hospital staff and the general population.

Neuro-oncology

Aim to do procedures that allow discharge as soon as possible (i.e. same day or next day)

Malignant Gliomas

< 70 yrs old (this is a guide and other factors e.g. comorbidities should be considered)
For the majority of cases - biopsy only and early discharge and refer for radiotherapy
Young patient + large tumour + significant mass effect + easily accessible tumour – consider craniotomy and debulking

>70 yrs old with clear diagnosis of High Grade Glioma on MRI
Radiotherapy without histological diagnosis

Metastases

Known cancer with single brain metastasis < 3 cm – SRS
Known cancer with single brain metastasis >3 cm with significant mass effect – Consider resection
New presentation with unknown primary – consider biopsy to get histology OR resection if superficial

Meningiomas

Consider surgery only in those with major mass effect and neurology (e.g hemiparesis) or which are life threatening.

Posterior fossa and CP angle tumours (Malignant or benign)

Consider surgery only in those with symptomatic major brainstem compression.
In those with hydrocephalus but without symptomatic brainstem compression, treat the hydrocephalus and defer treatment of the tumour itself.

Transnasal / Transsphenoidal Pituitary & suprasellar tumours

Some evidence from China, Italy and Iran is suggesting that transnasal procedures may be among the highest risk cases for spread of COVID-19 infection. Therefore:

1. Surgery should be performed only if absolutely necessary (e.g. patient experiencing rapid loss of vision)
2. If tumour debulking / optic chiasm compression has to be performed, consider craniotomy rather than transnasal approach.
3. Cystic craniopharyngiomas with optic chiasm compression and visual loss – consider Ommay reservoir and radiotherapy
4. If urgent transnasal surgery has to be performed, perform TWO preop COVID-19 tests (at 48 hrs and 24 hrs preop)
5. If Covid positive or emeregency transnasal surgery – appropriate PPE (powered air purifying respirators - PAPR if available) for all operating theatre staff until further data is available

Low grade gliomas

Monitor with MRI after 3 months. It is envisaged that urgent surgery would be rarely necessary in this group of patients.

Rare brain tumours (e.g. lateral/third ventricle/pineal)
Consider temporising measures such as ETV or VP shunt and delaying definitive surgery

Aneurysmal SAH

- *WFNS grades I-III* - Transfer for treatment according to usual protocols.
- *WFNS grades IV-V (ventilated patients)* - Selected poor grade patients will continue to benefit from neurosurgical treatment following local policy. However, during the COVID 19 pandemic, some with poor prognostic factors (e.g. elderly patients or those with significant comorbidities) are more likely to be managed conservatively in their local hospital.
- *Space occupying haematoma:* this will remain at the treating surgeon's discretion. It is likely that a higher threshold for treatment will need to be applied than usual.

CTA negative SAH

- Perimesencephalis SAH – If high quality CTA in local hospital is negative, consider avoiding DSA (review by neuroradiologist recommended).
- Non-permiesencephalis SAH – If high quality CTA in local hospital is negative, consider repeat CTA after 7 days and avoid DSA (review of CTA by neuroradiologist recommended)

Unruptured aneurysms – Only treat if expanding aneurysm causing new 3rd nerve palsy

Ruptured AVMs

- Space occupying haematoma or hydrocephalus – Consider transfer and treatment
- No space occupying haematoma or hydrocephalus - Consider transfer for embolisation or surgery if obvious bleeding point from associated aneurysm. Otherwise manage in local hospital and defer investigation till later date

Unruptured AVMs – Defer treatment

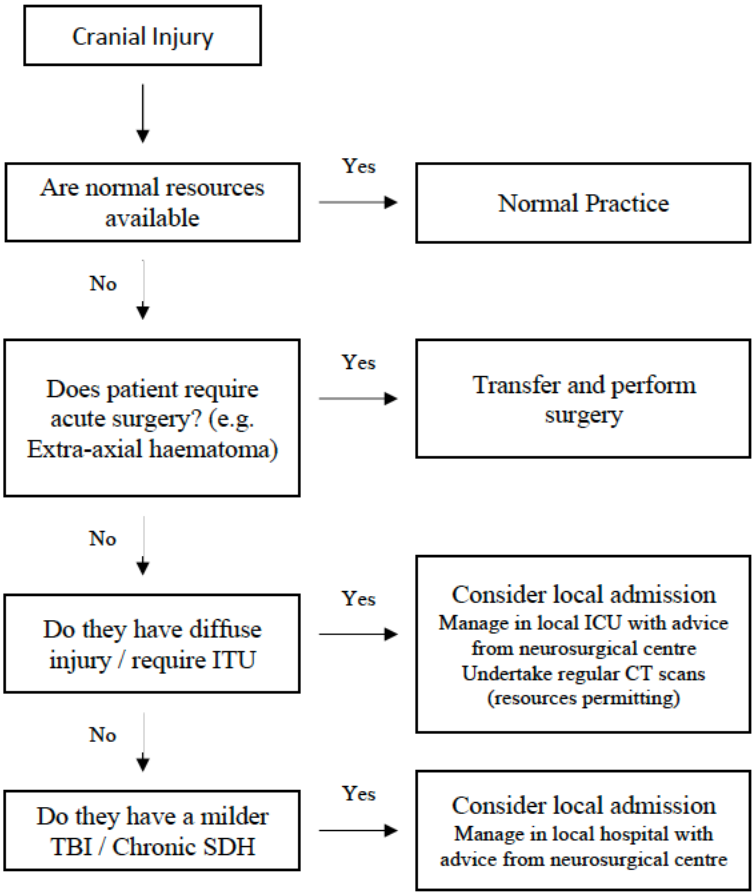
Cranial Dural AVFs
Ruptured or neurological deficit from cortical venous drainage – Consider treatment
Asymptomatic – Defer treatment

Spinal Dural AVFs
Treat cases with rapid neurological deterioration. Defer others.

Spontaneous intracerebral haemorrhage
Majority should be managed conservatively. Operate if lobar haematoma with significant mass effect + young age + deteriorating GCS.

Traumatic Brain Injury (TBI)

Adapted from SBNS/NHS guidelines – see flow chart below



*Joint management will require regular telephone/tele-video discussions

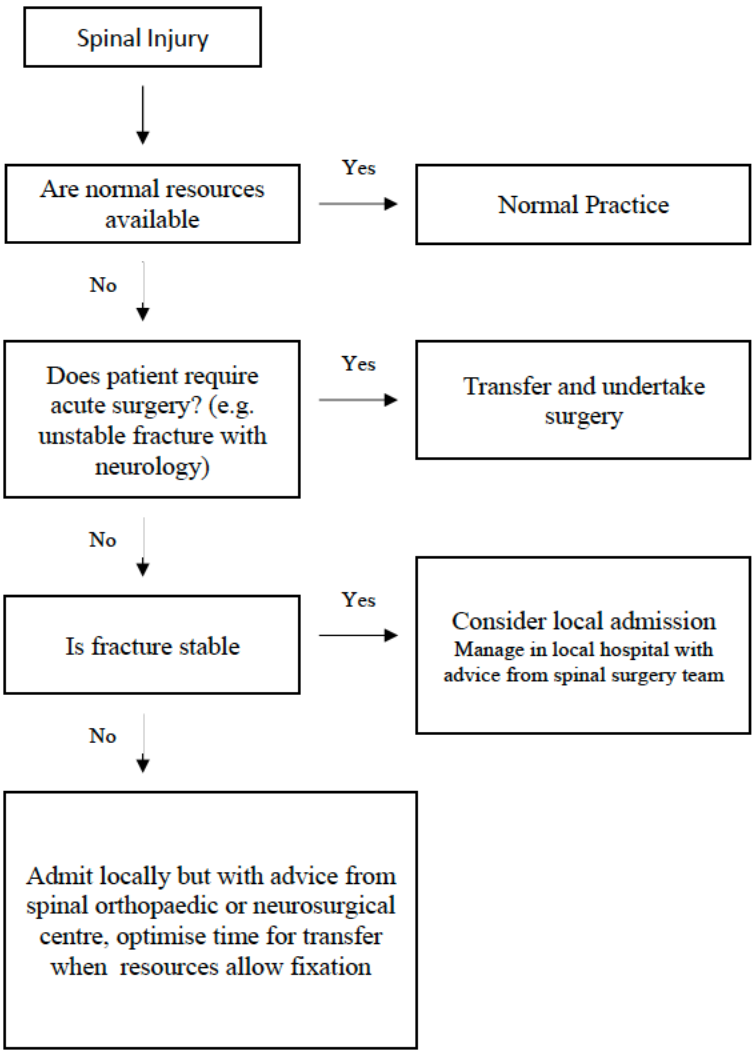
Spinal Tumours and degenerative disease

Consider surgery in cases of:

- Spinal cord compression
- Cauda equina compression
- Neural compression with progressive neurological deficit
- Intrinsic cord tumours with progressive neurological deficit

Spinal Tauma

Adapted from SBNS/NHS guidelines – see flow chart below



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