ADVERSE EVENT PROFILE IN *EN BLOC* RESECTION AND SURGERY FOR PRIMARY BONE TUMORS

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BACKGROUND

- Primary bone tumours of the spine are rare.
- Oncologically appropriate margins through Enbloc resection are necessary for cure.
- Procedures are long and complex; high adverse event (AE) potential.
- Accurate methods in collecting and reporting AE are lacking

PURPOSE

Primary

To determine the **AE profile** in patients undergoing surgery for primary bone tumor and enbloc resection for metastatic tumors of the spine

Secondary

Risk factors for AE Occurrence

METHODS

Design

- Retrospective review of prospectively collected data
- Quarternary care Academic Spine referral centre
- 2009 to 2017 - Primary Tumors undergoing surgical resection
  - Isolated metastatic lesions for EnBloc resection
  - No Intradural tumors

Outcomes

- Validated AE collection instrument: SAVES V2 (Spine Surgery Data Base of Adverse Events)

Statistical analysis

- Logistic regression analysis – univariate and multivariate

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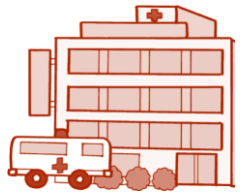
RESULTS

N = 107 (110 procedures)



Median Age	51 years (Range 16y – 87y)
Gender	Male 64 (61%) Female 43 (39%)
Median follow up	4.58 years (Range 3mo – 8.5 y)

Median LOS	**17 days**
30 day Mortality	**Nil**
Mean op Time (hh:mm)	Staged procedure(32) 17:43 Single stage(78) 09:15
Resection Margin	Enneking Appropriate (EA) = 69 Enneking Inappropriate (EI) = 27

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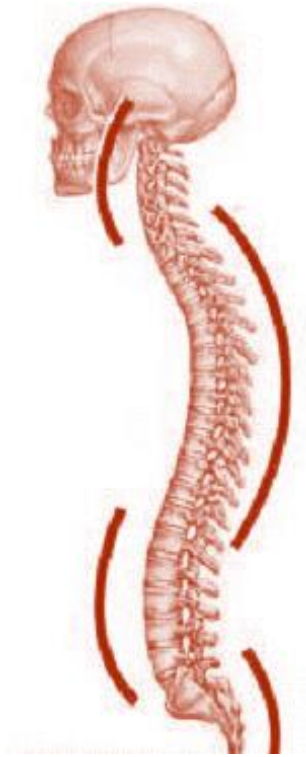
RESULTS



Primary Bone Tumor (PBT) **N= 92 (95 procedures)** Chordoma (28%) Chondrosarcoma(9%) Ewings (7%)	**Metastatic Tumor (Met)** **N = 15** Renal (25%) Rectum (25%) Lung (18%)
Tumour Location Mobile spine Fixed (Occiput /Sacrum)	 76(PBT) + 11 (Met) 19 (PBT) + 4(Met)
Neurological impairment (ASIA)	A = 0 B = 1 C=2 D = 17 E = 68 NK22

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ADVERSE EVENT PROFILE

Overall AE = 80 (72.7%)

Intraop = 30 (27.3%) Postop = 77 (70%)

Intraoperative AE

SYSTEMIC	N	%
Allergic Reaction	3	2.7
Anesthesia Related	3	2.7
Airway/ Ventilation	4	3.6
Cardiac Event	3	2.7
Hypotension	4	3.6

	N	%
Cord Injury	3	2.6
Dural tear/CSF Leak	17	15.5
Nerve Root Injury	7	6.4

	N	%
Bone – Implant interface failure	3	2.7
Hardware Malposition	4	3.6
Massive Blood Loss	19	17.3
Vascular Injury	5	4.5
Intraoperative Pressure Sores	3	2.7
Visceral Injury	5	4.5

ADVERSE EVENT PROFILE

Post-operative AE 77 (70%)

	N	%
Cardiac Event (MI/ Heart Failure/ Arrhythmia)	23	20.9
Anemia	23	20.9
Neurological Deterioration	10	9.1
Neuropathic Pain	17	15.5
Non-Union	6	5.4
Construct Failure	11	10

Wound related	**N**	**%**
Meningocele / CSF Leak	4	3.6
Superficial Wound Infection	4	3.6
Deep Wound Infection	8	7.3
Hematoma	2	1.8
Wound drainage	8	7.3
Wound Dehiscence	6	5.5

VTE	**N**	**%**
Pulmonary Embolism	4	3.6
Deep vein thrombosis	3	2.7
Post op Infection		
Systemic Infection	6	5.5
Urinary Tract Infection	25	22.7
Pneumonia	11	10
Pressure Sores	4	3.6

Other Systems	N	%
Delirium	20	18.2
Dysphagia	9	8.2
Dysphonia	3	2.7
Respiratory	17	15.5
GI(constipation)	4	3.6
GI Bleeding	2	1.8
Electrolyte imbalance	7	6.4

AE SIGNIFICANT ASSOCIATIONS

- Post operative AE **increased Length of stay** p=0.01
- Higher wound complications around **fixed spine** p=0.01

  Fixed spine (46%) v mobile spine (12%)
- More AE occurrence during **staged procedures**

  (especially wound complications and Intraoperative AE p=0.01)

  Staged procedure (78%) v Single procedure (68%)
- Tracheostomy and PEG insertion required in **Cervical Spine** procedures

  Cervical spine (35%) v non Cervical spine (4.4%) p <0.02
- Wound complications associated with **increased ICU stay** p=0.01

SUMMARY- CONCLUSIONS

- High Incidence of AE with Enbloc resection and surgery for Primary bone tumors

- Risk factors are:
  - Staged procedures
  - Wound complications around Fixed spine
  - Tracheostomy/PEG insertion for Cervical spine procedures
  - Female gender

- Knowledge about AE profile useful for:
  - patient pre-operative counselling and informed consent
  - Resource planning centralization of care
  - To Optimise preventative strategies
    - Specialised/ experienced multidisciplinary surgical team

DISCLOSURES

- R Charest – Morin
- S Srinivas
  - Nothing to disclose
- N Dea
  - Consultant – Stryker
- C Fisher
  - Consultant Medtronic