The Third Annual International Neurosurgery Conference
15–16 December 2007
www.surgicalneurology.org

Programme

The annual scientific i-meeting of the

Neurosurgery Research Internet Forum
Neurovascular Internet Forum
Skull-base-surgery Internet Forum
Functional & Stereotactic Neurosurgery Internet Forum
Neuro-oncology Internet Forum
Spine Internet Forum
Neurotrauma Internet Forum
Neurosurgeons’ Social Network

Sponsored by

Annals of Neurosurgery
www.annals-neurosurgery.org
The Third Annual
International Neurosurgery Conference
15–16 December 2007

www.surgicalneurology.org

Patron
Professor Alan Crockard

Past Patrons
Dr Robert Harbaugh
(2006)

Dr James T Rutka
(2005)

Scientific Advisory Board
Alkandy L (Glasgow, UK)
Bansal KK (Dehradun, India)
Belli A (Southamton, UK)
Elgamal E (Riyad, KSA)
Fujimaki T (Toyko, Japan)
Fink R (Berkeley, USA)
Harbaugh R (Hersey, USA)
Jallo GI (Baltimore, USA)
Kuszel Y (Moscow, Russia)
Leggate JSR (Greater Manchester, UK)
Loeser JD (Seattle, USA)
Meixensberger J (Leipzig, Germany)
Rutka JT (Toronto, Canada)
Slavin K (Chicago, USA)
Quintana, L (Valparaiso, Chile)
Yampolsky C (Buenos Aires, Argentina)
Zuccarello M (Cincinnati, USA)

Organiser
Dr G Narenthiran
g_narenthiran@hotmail.com
It is indeed an honour and pleasure to be invited to be the Patron of this Third Annual International Neurosurgery Conference, which by its very format shows that Neurosurgical thinking is at the cutting edge of technology and communication. It is humbling to remember my first exposure to this speciality which depended so heavily on clinical examination and whose investigative tools were angiography, air encephalography and midline shift in trauma judged by ultrasound. I can remember a Polaroid photograph of a CAT scan of a brain tumour from London in the early '70's, amazed at the detail. From there to today where day case “keyhole” surgery for brain tumours is increasing, modulation of movement, pain and even mood possible and restoration of damaged spinal cord function just round the corner, what a privilege to be part of this specialty.

This Third Annual Conference demonstrates the immediacy of a ‘virtual’ conference, allowing deeper questioning of ideas than might be afforded by 2 minutes of questions after a conventional symposium session. It also allows all of us to continue the conversations with each other well after this conference technically ceases. I believe it will provide a useful bridge between institutions and individuals to further progress the exciting developments in our speciality.

I thank Naren for the huge amount of work he has put into this to ensure it will be a “big hit”. I wish all of you success in your endeavours.
I am honored to introduce the Second Annual Neurosurgery Conference on the Internet. It is fitting that neurosurgeons serve as leaders in developing the potential of the internet for surgical education. Neurosurgeons, being technologically sophisticated, have led the way in fields like minimally invasive surgery, image guided surgery and radiosurgery. Other surgical specialties are following. It is only proper that we also lead the way in developing internet based international surgical conferencing.

We have barely begun to harness the potential of the internet for neurosurgical uses. At present there are neurosurgical websites, sponsored by professional societies, academic institutions, industry and others, that serve as sources of information about neurosurgery. In the last few years we have just begun to collect clinical data on-line for use in graduate medical education. There is great potential here. In the foreseeable future I believe that we should, and will, use the opportunities that the internet offers for the collection, storage, analysis and feedback of clinical research information. We could create, in effect, one immense reservoir of clinical research data that would allow us to answer many neurosurgical questions. I believe that we will do this. A conference like this, using the internet to bring together neurosurgeons from around the world to share their experience, is one small step toward such a visionary goal.

Welcome to the Second Annual Neurosurgery Conference on the Internet. I hope you have a wonderful conference.

Dr Robert E. Harbaugh
MD, FACS, FAHA
Professor and Chairman
Department of Neurosurgery
Professor, Department of Engineering Science and Mechanics
Penn State University – Milton S. Hershey Medical Center,
Hershey, Pennsylvania
The other day, I had the rare opportunity to watch a 16 mm movie regarding the life and times of Harvey Cushing that was sponsored by the American Association of Neurological Surgeons. There was footage within this movie of Cushing in the operating room performing his 3000th brain tumor operation. In the days of Cushing, neurosurgery education was comprised of hands-on experience in the OR and on the wards and clinics, of didactic teaching sessions with one’s mentor, and of learning within written texts of neurosurgery. While we still value all of these methods of teaching, the computer age has ushered in a valuable new way for neurosurgeons and neurological trainees to learn their craft. I believe the First Annual Neurosurgery Conference on the Internet represents one of the outstanding opportunities for neurosurgeons and trainees to share their experiences and knowledge in the basic science of neurosurgery and in the clinical research realm. I wish you all an excellent session, and hope there will be many more to come.

Dr James T Rutka
MD, PhD, FRCSC, FACS, FAAP
Dan Family Chair in Neurosurgery
Professor and Chairman
Division of Neurosurgery
The University of Toronto
Toronto, Canada
The Third Annual International Neurosurgery Conference

1.

<table>
<thead>
<tr>
<th>Name and e-mail address of the corresponding author</th>
<th>Amr Mohamrd Hazem Zakaria; e-mail <a href="mailto:smfwat@yahoo.com">smfwat@yahoo.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Reduction of blood loss in spine surgery by large doses of tranexamic acid: A prospective blinded, randomized controlled study</td>
</tr>
<tr>
<td>Authors</td>
<td>Elwatidy S, Jamjoom Z, Elgamal E, El-Dawlatly A, Zakaria A</td>
</tr>
<tr>
<td>Affiliation</td>
<td>Department of Neurosurgery, King Khalid University Hospital, Riyadh, Saudi Arabia</td>
</tr>
<tr>
<td>Aim</td>
<td>Tranexamic acid (TA) is an antifibrinolytic drug which is used routinely to reduce bleeding in cardiac surgery, however, its use in neurosurgery is uncommon and only few studies reported the use of antifibrinolytic drugs in spine surgery. The aim of the study was to find out the effect of a large dose of tranexamic acid on blood loss during spinal operations.</td>
</tr>
<tr>
<td>Method</td>
<td>The study was carried out at King Khalid University Hospital (Riyadh, Saudi Arabia) during the period; 6/2005 to 12/2006. It is double blind randomized placebo controlled study. All patients undergoing spinal surgery where significant blood loss is expected were included in the study. Patients with coagulopathies were excluded from the study.</td>
</tr>
<tr>
<td>Results</td>
<td>64 patients were included in the study, 32 patient in each group (the placebo and TA). Statistical analysis showed significant difference in the amount of blood loss (p &lt; 0.007), and blood transfused (p &lt;0.008) to the patients in both groups. The duration of surgery and hospital stay were shorter in the Tranexamic acid group, but did not reach statistical significance. There were no complications related to the use of large doses of Tranexamic.</td>
</tr>
<tr>
<td>Conclusion</td>
<td>The use of Tranexamic acid during spinal surgery has significantly reduced blood loss and blood transfusion and it was not associated with complication. We strongly recommend its use during neurosurgical operations (spinal and cranial).</td>
</tr>
<tr>
<td>Competing interests</td>
<td>None declared</td>
</tr>
</tbody>
</table>
The Third Annual International Neurosurgery Conference

2.

Name and e-mail address of the corresponding author

Tayfun Hakan; tayfunhakan@yahoo.com

Title

Morphometric and ultrastructural effect of drotrekogin alpha (active protein C) on spinal cord trauma model

Authors

Guler D (1), Berkman MZ (1), Orakdogen M (1), Hakan T (1), Aker FV (2), Bilir A (3), San T(4)

Affiliation

Clinics of Neurosurgery (1) and Pathology (2), Haydarpasa Teaching and Research Hospital, Department of Histology and Embryology (3), Istanbul University, School of Medicine, Department of Histology and Embryology (4), Marmara University, School of Medicine, Turkey

Aim

Drotrekogin alpha (active protein C) (APC) is a drug, which has multiple effects including anti-inflammatory, antitrombotic and poribrinolytic effects on tissue. In this presented study, the examination of the morphometric and ultrastructural effect of drotrekogin alpha (active protein C) (APC) on spinal cord trauma model.

Method

Sprague-Dawley rats randomly separated into three groups; I [n:7; dorsal laminectomy], II [n:7; laminectomy + spinal cord trauma using Allen’s spinal cord trauma method, and III [n:7; laminectomy + trauma + 100 μg/kg recombinant protein C (activated)]. All the animals were scarified at the end of 4th week. 10 mm segments of spinal cord were removed and examined with light microscope, and transmission electron microscopes and for morphometric analysis.

Results

Between trauma and drug group, a significant statistically differences observed in respect to number of neurons and infarct area in light microscopic examinations. Electron microscopic examinations revealed differences between trauma and drug group in respect to membranes of the nuclei, the structures of the axons, myelin sheets, the mitochondrion, endoplasmic reticulum and ribosome in the favor of drug group.

Conclusion

Drotrekogin alfa had a neuroprotective effect on the spinal cord in case of trauma. Data make us to suggest, this drug may be reduce the effects of traumatic ischeima with its anti-inflammatory, antitrombotic and poribrinolytic effects.

Key words (max 100 characters):

Drotrekogin alpha, spinal cord trauma, inflammation

Competing interests:

None
### Title
Space-occupying cerebellar infarct: a review

### Authors
Moscote-Salazar LR, Kafury-Benedetti K, Sabogal-Barrios R.

### Affiliation
Department of Neurosurgery, Universidad de Cartagena, Cartagena, Colombia.

### Aim
Space-occupying cerebellar infarcts (SOCI) make up a subgroup within the ischemic pathologies of the brain which are generally well tolerated clinically and usually respond well to medical treatment.

### Method (max 450 characters):
Case records, computed tomographic scans, IRM case reports of 2 patients with space-occupying cerebellar infarcts defined by computed tomographic criteria were re-evaluated with regard to clinical course, etiology, therapeutic management, mortality, and functional outcome.

### Results
Decompressive surgery should be the treatment of choice for massive cerebellar infarction causing progressive brain stem signs or impairment of consciousness.

### Conclusion
These patients must be carefully controlled because of the risk of clinical deterioration, in which case timely surgical intervention can increase their survival.

### Key words
Cerebellar infarct, conservative treatment, decompression therapy.

### Competing interests:
None
The Role of Thromboprophylaxis in Elective Spinal Surgery

Aim
The high rate of venous thromboembolism complications following neurosurgical operations is well documented. The reported incidence rates of symptomatic thromboembolic disease in spinal surgery are estimated between 0.5 to 3.4%. The use of thromboprophylaxis in surgery has been demonstrated to improve survival outcomes and now is recommended by the National Institute for Health and Clinical Excellence. However, on a practical level, these guidelines have not been universally implemented as the perceived complications of anticoagulation have outweighed its potential benefits. Therefore, its routine use is not a standard and established practice in elective spinal surgery in England. As venous thromboembolism remains a serious complication resulting in increased morbidity, mortality and cost, we have investigated the incidence of symptomatic thromboembolism after elective spinal surgery in patients given post-operative thromboprophylaxis and analysed the complications.

Method
In this retrospective study, 100 patients who underwent elective spinal surgery from March 2007 to July 2007 were analysed. A review of the case notes and electronic database was performed. In addition to demographic data, approach (anterior or posterior), the anatomical level of surgery (cervical, thoracic and lumbar), type of procedure (primary or revision), duration of surgery, start of treatment, presence of pre-existing risk factors and outcomes were all collected. All patients were given mechanical prophylaxis and low molecular weight heparin (enoxaparin 40mg OD) on their operative day. Treatment continued until the patients were fully mobile. Patients who were considered high risk for thromboembolic disease were included in this study and were treated in a similar fashion. Symptomatic thromboembolic disease was diagnosed when patients showed significant clinical signs or symptoms of a deep venous thrombosis (DVT) or pulmonary embolism (PE). In cases of suspected DVTs, diagnosis was confirmed by duplex scan of the lower limbs; furthermore in cases of suspected PEs, diagnosis was confirmed by CTPA.

Results
There was no reported incidence rate of symptomatic thromboembolic disease in this population. A total of 3 patients showed clinical signs of deep venous thrombosis; however all had negative duplex scans. A total of 2 patients were investigated for symptomatic pulmonary embolisms, but their investigation revealed lower lobe pneumonia and a pulmonary effusion, respectively. Moreover, there were no reported deaths. A total of 5 patients had direct complications of anticoagulation: minor bleeding (haemoglobin drop ≤ 2 g/dL or transfusion ≤ 2 or more units of blood products) and local skin reaction (mild local irritation, pain, ecchymosis and erythema). All complications were reported in patients who underwent a posterior approach of the lumbar spine. A total of 1 patient was investigated for a spinal or epidural haematoma for evolving neurological signs, which in turn the underlying lesion was excluded. Patients receiving the first dose of enoxaparin ≥12 hours postoperatively had significantly fewer complications ($p<0.05$). Furthermore, when inject sites were rotated the rate of local skin reaction complication were also reduced.

Conclusion
We report no incidence of clinically symptomatic thromboembolic complications following elective spinal surgery. However, complication following the administration of low molecular weight heparin related to the level of spinal surgery, surgical approach and delayed mobilisation. Moreover, we identified a number of future areas of improvement. Treatment should commence after at least 12 hours following surgery, injection sites should be rotated to minimize local skin reactions, and early mobilization should be encouraged. It would be beneficial to risk stratify patient prior to surgical intervention. In light of our findings, enoxaparin should be given to patient undergoing elective spinal surgery to prevent mortality and morbidity associated with thromboembolic disease. A prospective database will be invaluable to continue monitoring thromboembolic disease within this Neurosurgical Department.

Key words
Thromboprophylaxis, spinal surgery, benefits, complications

Competing interests: Not declared
### Case report: Cystic meningioma

#### Aim
We report the management of a single case of a cystic meningioma and review the relative literature.

#### Method
We report a single case of a cystic meningioma treated surgically with stereotactic aid.

#### Results
A 57 year old female presented with a history of numbness of the left upper extremity and episodes of headaches. CT and MRI scans were performed revealing a large cystic lesion located at the right parietal lobe with a nodule part at the circumference. The imaging characteristics of the lesion revealed a cystic meningioma with a differential diagnosis of a cystic astrocytoma. A total, stereotactically aided resection of the tumor was achieved.

#### Conclusion
Cystic meningiomas are an uncommon histologic type of tumor accounting for 1.7%-11.7% of all intracranial meningiomas. Their imaging characteristics are mimicking cystic astrocytomas but they demonstrate different prognosis and require different operative strategies.

#### Key words
cyst, meningioma, MRI, surgery, stereotaxy

#### Competing interests:
none
<table>
<thead>
<tr>
<th>Name and e-mail address of the corresponding author:</th>
<th>Senthil Selvanathan; <a href="mailto:senthil-kumar@doctors.org.uk">senthil-kumar@doctors.org.uk</a></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td><strong>Management of penetrating craniocerebral injuries from nail-gun use</strong></td>
</tr>
<tr>
<td><strong>Authors</strong></td>
<td>Selvanathan S, Goldschlager T, McMillen J, Campbell S</td>
</tr>
<tr>
<td><strong>Affiliation</strong></td>
<td>Kenneth G. Jamieson Department of Neurosurgery, Level 7, Ned Hanlon Building, Royal Brisbane Hospital, Herston QLD 4029, Australia.</td>
</tr>
<tr>
<td><strong>Aim</strong></td>
<td>Outcome of closed gentle traction in the management of penetrating craniocerebral nail-gun injuries with extracranial extension.</td>
</tr>
<tr>
<td><strong>Method</strong></td>
<td>Three cases of penetrating craniocerebral nail-gun injuries with no vascular involvement and with extracranial extension were selected. Preparations for craniotomy and/or endovascular intervention was made in case of any haemorrhagic or ischaemic sequelae. In all three cases the nails were removed via closed gentle traction craniotomy and/or endovascular support.</td>
</tr>
<tr>
<td><strong>Results</strong></td>
<td>The nails were removed successfully. Post-operatively all three patients had an uneventful recovery and remained fully conscious with no neurological deficits. A post-operative CT scan revealed no signs of intracranial haemorrhage.</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>If angiography is negative for vascular involvement and the patient is asymptomatic, the nail can be extracted via closed gentle traction. However patients with vascular symptoms or nail with no extracranial extension should be considered for craniotomy.</td>
</tr>
<tr>
<td><strong>Key words</strong></td>
<td>Foreign bodies, penetrating head injuries, nails, nail-gun</td>
</tr>
<tr>
<td><strong>Competing interests:</strong></td>
<td>Nil</td>
</tr>
</tbody>
</table>
Title: The Technical Importance of Decreasing the Tension inside the Neck and Dome during Aneurysm Surgery - Specially Big and Giant Aneurysms

Aim:
The surgery for big and giant cerebral aneurysms, always is an interesting challenge to the neurosurgeon.

The problems, that may happen during a very tense aneurysm neck and dome are: (1) Neck impossible to clip, (2) Main artery stenosis due to clip migration, (3) Rupture of aneurysm neck, and (4) Dome difficult to manage.

Method:
In this presentation, 3 cases of big aneurysms are presented.

One case of ruptured big ACA aneurysm, with wide neck at the right A2 portion, one case of ruptured big left MCA aneurysm, with wide neck, and one case of ruptured right MCA aneurysm with very wide neck.

The Brain protection, during the temporary clipping was performed with Propofol, to decrease the cerebral metabolic need, and nimodipine plus manitol to improve the collateral circulation to the brain area under circulatory arrest.

Results:
Based in our experience in managing 760 aneurysms operated cases, from 1990 to 2006, after decreasing the endoluminal tension, during temporary clipping, under brain protection, is possible to: 1- Open de dome, 2- Extirpation of endoluminal clots, 3- The walls of the dome become more easy to dissect from neighbouring arteries, 4- the neck become relaxed, 5- The dome is more easy to mobilize, and 6- Easy and safety clipping of the neck is possible to perform.

Conclusion:
Under Brain Protection using temporary clipping for decrease the tension of the aneurysm neck and dome, the surgery of Big and Giant Aneurysms is more safety to the patient, and give the surgeon more possibilities to get successful results.

Key words:
Aneurysm surgery, temporary clipping, brain protection

Competing interests:
none
### Title
Is it possible to predict facial nerve function after vestibular schwannoma surgery? A clinical and radiological analysis.

### Authors
Gerganov VM, Nouri M, Luedemann W, Samii A, Samii M

### Affiliation
International Neuroscience Institute, Hannover, Germany

### Aim
To determine if the preoperative clinical and radiological features are reliable in predicting facial nerve function after vestibular schwannoma surgery. The main shortcomings of most of the previous studies were the heterogeneous characteristics of the analyzed groups.

### Method
A retrospective study of 99 consecutively operated patients with VS. Data collected included the main clinical features and the following radiological parameters: tumor size, volume, extension in relation to the internal auditory canal, width and length of the intrameatal tumor portion; tumor-fundus distance, and changes of the internal auditory canal. Statistical analysis has been performed with both parametric and nonparametric tests.

### Results
Headache as initial symptom gait instability and facial nerve function at presentation were negative predicting factors. Tumor growth in all directions had significant correlation with facial outcome, but anterior and/or caudal had more significant correlation than posterior and/or inferior extension. Polycyctums had the worst prognosis. Neither intrameatal length nor width and tumor-fundus distance influenced significantly the outcome.

### Conclusion
The preoperative analysis of the neuroradiological images and of neurological status of the patient could give reliable clues regarding the chance of preserving good facial nerve function after surgery.

### Key words
vestibular schwannoma, facial nerve outcome, predictive factors

### Competing interests
None
The Third Annual International Neurosurgery Conference

9.

| Name and e-mail address of the corresponding author | Abouzari M; abouzari.m@gmail.com |
| Title | **Outcome Evaluation of Chronic Subdural Hematoma Using Glasgow Outcome Score** |
| Authors | Abouzari M, Asadollahi M, Aleali H |
| Affiliation | Amir-Alam Hospital, Medical Sciences/University of Tehran, Tehran, Iran |
| Aim | The relationship between Glasgow Outcome Score (GOS) and its probable effective factors has not been determined, yet. The purpose of this study was to evaluate whether GOS at discharge as a measure of outcome is correlated with its effective factors in patients with chronic subdural hematoma (CSDH). |
| Method | One hundred and sixteen consecutive patients with CSDH were studied. The variables considered were age, sex, trauma-surgery interval, type of surgery, type of trauma, Glasgow Coma Score (GCS) on admission, hematoma density, and postoperative hospitalization. The relationship between type of surgery and postoperative hospitalization was also studied. |
| Results | There were no significant relationship between age, sex, type of trauma, and postoperative hospitalization and GOS. On the other hand, shorter trauma-surgery interval (P=0.015), lower GCS (P<0.001), and higher hematoma densities (P=0.001) had significant association with unfavorable outcome as defined by GOS. Burr-hole craniostomy had shorter postoperative hospitalization when compared with small craniotomy (P=0.003). |
| Conclusion | Higher hematoma densities, lower GCS, and shorter trauma-surgery interval increase the risk of unfavorable outcome after CSDH. Burr-hole craniostomy is more cost effective procedure when compared with small craniotomy because of its shorter postoperative hospitalization. |
| Key words | Chronic subdural hematoma, Glasgow Outcome Score, Surgery |
| Competing interests: | None |
Name and e-mail address of the corresponding author
Konstantin Slavin, MD; kslavin@uic.edu

Title
Practical Algorithm for Surgical Management of Facial Pain

Authors
Slavin KV, Colpan ME, Munawar N, Nersesyan H

Affiliation
Section of Stereotactic and Functional Neurosurgery, University of Illinois at Chicago

Aim
Despite multiple recent advances, a choice of appropriate surgical approach to various categories of facial pain remains confusing. The goal of this presentation is to introduce a simple and practical algorithm for surgical treatment of medically intractable facial pain.

Method
Based on our clinical experience, we analyzed the decision tree in choosing appropriate surgical intervention based on the nature of the facial pain, its location and patterns, presence of other contributing or causative factors, imaging findings, patient’s medical condition and ability to withstand certain interventions, as well as willingness to have surgery, and summarized it into a simple algorithm, usable in routine medical practice.

Results
With a simple set of questions, it is possible to establish the likely diagnosis for each particular patient and then come up with a rational choice of one of the ten procedures listed in the algorithm tree. Use of this algorithm has shown itself both easy and reliable in approaching most facial pain patient categories. More than 100 consecutive patients have been treated with the algorithm assistance achieving a very high initial success rate.

Conclusion
The presented algorithm may be utilized in routine clinical practice and seems to provide guidance for both experienced surgeons and relative beginners of the field. This algorithm may be validated only by use in larger group of the patients and in multiple institutions.

Key words
Facial Pain, Trigeminal Neuralgia, Microvascular Decompression, Gangliolysis, Radiosurgery

Competing interests:
None
### Title
**Accuracy of intra-operative rapid diagnosis by SQUASH smear in central nervous system lesions - An early institutional experience.**

### Authors

### Affiliation
Department of Neurosurgery, Himalayan Institute of Medical Sciences, Dehradun, India

### Aim
Intra-operative cytological diagnosis of the CNS lesions helps the neurosurgeon to decide about the extent of resection particularly in eloquent areas. The squash or crush preparation of the available tiny tumor tissue at the start of the resection is a time saving and lead to better decision on further plan of surgery. This study was conducted to find out the accuracy of this technique at our center.

### Method
We have prospectively studied the accuracy of this technique at our institute. During the period of last 2 years we have operated 118 CNS mass lesions including cranial and spinal included in the study.

### Results
Our early experience concluded that Intra-operative SQUASH smear cytology is a fairly rapid and reliable method of intra operative diagnosis for a wide spectrum of central nervous system lesions.

### Conclusion
Out of total 118, cranial lesions were 105 and spinal were 13. Males outnumbered in frequency (77 cases, 65.2%) while the females comprised 41 cases (34.7%). Most (59.2%) of the patients were from 20 to 50 years of age. The cerebral hemisphere including all lobes had the largest number of cases (49 cases, 41.5%). Among them glial tumors form the major group (34 cases, 28.8%). Meningiomas were the next main group (18 cases, 15.3%) followed by schwannomas and metastatic tumors having 9 cases (7.7%) each. The cytological or squash diagnosis was possible in all except 11 cases (9.3%), in which a definite diagnosis could not be provided due to fibrous tissue, necrosis, and hemorrhage or poor preservation of cytological features.

### Key words
Brain tumors, Glioma, spinal tumors, squash preparation, Neuropathology

### Competing interests:
None declared
The Third Annual International Neurosurgery Conference

<table>
<thead>
<tr>
<th>Name and e-mail address of the corresponding author:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bansal KK; <a href="mailto:kbansalk@yahoo.com">kbansalk@yahoo.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical cord injury: comparison of clinico-radiological picture with mode of injury</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bansal KK, Gupta C, Mittal M, Goel D</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Neurosurgery, Himalayan Institute of Medical Sciences, Dehradun, India</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>To find out the severity of cord injury in relation with mode of injury. Cervical cord injury is a potentially devastating consequence of acute trauma. This disastrous and crippling disease occur very frequently among whole spinal column and accounts for 5% of Roadside accidents (RSA). The prognosis of cord injury has direct relation with mode of injury, making it hard to evaluate other indicators of improvement without considering them. The most common types of cord injury include contusion or compression. Other types of injuries include lacerations, and central cord syndrome or simple whiplash injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>We have retrospectively analyzed 37 patients of cervical cord injury admitted during last two years in our institute, which is in foothills of Himalayas. We categorized them into four groups- A) Fall from height (FFH), B) Roadside accidents, C) Accidental injury due to carrying heavy weight over head D) Trivial Trauma in Pre-existing spondylotic spine, to compare the clinical and radiological features with mode of injury.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Among these most of the patients (19) had cord injury following fall from height, ten patients got injured in RSA, five of them received accidental injury while carrying weight over head and rest of them belonged to fourth group. Sex ratio shows male predominance (29:8) with mean age of 32 years at the time of injury. Mid cervical region (C4-5) was most common site of injury in twenty-seven patients while five each had involvement of upper (C1-3) and lower (C6 and below) cervical region. 19 patients out of 37, presented with complete cord injury, with and without respiratory muscles involvement, 15 had incomplete cord injury and rest three patients had no neurological deficit. All patients of RTA group and nine patients of FFH group had complete injury while none of the third group had complete injury. All these patients were screened with plain X-rays, lateral view of cervical spine and Magnetic Resonance Imaging of cervical spine. Twenty two patients (all patients of RTA and 12 patients of FFH) showing fracture dislocation of vertebral bodies with cord contusion and haematomyelia, with complete type of cord injury, but varying degrees of sub-luxation found to have mere cord edema with clinical picture of incomplete cord injury, in rest of the patients. Out of three patients with pre-existing spondylosis, two had increment of disc bulges with cord compression and oedema but the rest one had haematomatymia with contusion in addition. The Frankel scale has been used for the assessment of patients for neurological and functional classification of spinal cord injury (SCI). All patients of RSA group were found to have Frankel grade 1 neurological deficit, while less than half patients from FFH group had similar deficit. Rest other patients who belonged to group B, C &amp; D, were had better Frankel scale.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal cord injury is frequently occurring and preventable problem. The severity of which depends upon the mode of injury. High-speed accidents in RSA leads to complete cord injury type of picture, while in other categories the severity of disability is easily manageable with relatively good outcome.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key words</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Competing interests:</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
</tbody>
</table>