



## **Dr. Subhash Kumar**

MD Radiodiagnosis, DM Neuroradiology

**Email:** [drsubhash.dm@gmail.com](mailto:drsubhash.dm@gmail.com), drsubhashk@aimspatna.org

**Mobile:** +91-8676836533

**Summary:** Neuro- and Interventional radiologist with 9 years of experience, working as a teaching faculty in an academic institute and tertiary care hospital.

### **Current designation:**

Assistant Professor, Department of Radiodiagnosis, All India Institute of Medical Sciences (AIIMS), Patna, Bihar, India -801105, from *22/02/2013 till date*.

### **Work experience:**

- Associate Consultant, Neuroradiology, at Sri Balaji Action Medical Institute, Paschim Vihar, New Delhi, India -110063, from *02/01/2012 till 21/02/2013*
- Attending Consultant, Interventional Neuroradiology, Department of Interventional Neurology, Max Superspeciality Hospital, Saket, New Delhi, India-110017, from *30/08/2010 till 31/12/2011*.
- Teleradiology experience: Worked for i2iteleradiology, Bangalore, India

### **Education:**

DM Neuroradiology: July2007-July2010; All India Institute of Medical Sciences (AIIMS, New Delhi)

MD Radiodiagnosis: 2004-2007; Civil Hospital, BJ Medical College, Ahmedabad

MBBS: 1995-2001; Bangalore Medical College, Bangalore

### **Expertise:**

*Interventional Procedures:* Vascular- All angiograms, all neurointervention procedures – carotid angioplasty, acute stroke thrombolysis and thrombectomy, aneurysm coiling, AVM

embolization, venous stenting, spinal AVM embolization, tumor embolization; basic Peripheral intervention - bronchial artery embolisation, lower limb angioplasty, abdominal angiograms and embolization, soft tissue AVM embolization, tumor embolisation; USG and CT guided- drainage, biopsy, catheterization; percutaneous hepatobiliary procedures: PTBD, biliary stenting.

*MRI*: CNS (including spine), head and neck; musculoskeletal

*CT*: Head and neck, musculoskeletal, body

*Doppler studies*: Vascular, Transcranial Doppler, CLOTBUST

*Ultrasound*: Local part, soft tissue, head and neck, musculoskeletal

## **ACADEMICS:**

### **Thesis:**

MD- USG and Doppler in evaluation of scrotal lesions

DM- 1) Diffusion tensor Imaging in the evaluation of intractable partial seizures

2) 2D DSA vs 3D Rotational Angiography in follow up of treated intracranial aneurysms

### **Papers published:26**

- Vivek Kumar, Kranti Bhavana, Prem Kumar, Subhash Kumar. Ultrasonography Guided Excision of Isolated Cysticercosis of the Temporalis Muscle Causing Intractable Headache: A Rare Case Report. *Indian J Otolaryngol Head Neck Surg* 2016; 68(3):387–390; DOI 10.1007/s12070-015-0933-5
- Kranti Bhavana, Subhash Kumar. Modifying radiology protocols for cochlear implant surgery in a government sponsored scheme: Need of the hour. *International Journal of Medical Research & Health Sciences*, 2016; 5(6):151-157
- Deependra Kumar Rai, Subhash Kumar, Somesh Thakur. A rare case of tubercular pansinusitis with orbital and intracranial extension. *Lung India* 2016; 33(3):349-351. DOI: 10.4103/0970-2113.180960
- Kumar S. A patient with pycnodysostosis presenting with seizures and porencephalic cysts. *JNRP J Neurosci Rural Pract* 2014; 5 (3):284286.
- Subhash Kumar. Endovascular neurointervention success and complication rates in first year of independent practice in a suburban hospital setup. *JNRP Journal of neuroscience in rural practice* 2014; 5(1): 11-17
- Subhash Kumar, Shailesh B. Gaikwad, Nalini Kant Mishra. 3D Rotational angiography in follow up of clipped intracranial aneurysms. *ISRNI Radiology* 2014;2014:1-5. DOI: 10.1155/2014/935280
- Subhash Kumar, Prem Kumar. Truncus bicaroticus with aberrant right subclavian artery and origin of right vertebral from right common carotid artery. *Surg Radiol Anat* 2013; **published online**: DOI 10.1007/s00276-013-1232-z
- Subhash Kumar, Nalin K Mishra. Middle meningeal artery arising from the basilar artery: report of a case and its probable embryological mechanism. *JNIS J NeuroIntervent Surg* 2012;4:43-44.

DOI:10.1136/jnis.2010.004465

- Sumit Goyal, Subhash Kumar, Rohitash Sharma, Shakir Husain. Unusual thromboembolic complication during an anterior communicating artery aneurysm coiling. *JNIS J NeuroIntervent Surg* 2011;3:352-354. DOI:10.1136/jnis.2010.004457
- Ashish Bindra, Girija P Rath, Sachidanand J Bharti, Keshav Goyal, Subhash Kumar. Neurogenic pulmonary edema after rupture of intracranial aneurysm during endovascular coiling. *Saudi Journal of Anaesthesia* 2011; 5 (3): 323-325.
- S Kumar, EM Justin, NK Mishra. Fenestrated posterior inferior cerebellar artery with concomitant vertebro-basilar junction fenestration and vertebral artery aneurysm. *Clinical Neuroradiology Online* first 29 July 2011. DOI: 10.1007/s00062-011-0070-9
- Subhash Kumar, Rohitash Sharma, Sumit Goyal, Shakir Husain. Occipital artery occlusion to facilitate trans-mastoid posterior fossa tumor embolisation. *JNRP Journal of Neurosciences in Rural Practice* 2011; 2:178-179
- SB Gaikwad, Sandeep Sharma, Subhash Kumar. Successful embolization of a conus medullaris arteriovenous malformation using onyx. *Neurol Ind* 2010; 58(5): 817-818. DOI: 10.4103/0028-3886.72207.
- Sandeep Sharma, Subhash Kumar. Hematomyelia due to anterior spinal artery aneurysm in a patient with coarctation of aorta. *Neurol Ind* 2010; 58(4): 675-676. DOI: 10.4103/0028-3886.68697
- Sandeep Sharma, Subhash Kumar, Leve Joseph, Vikas Singhal. Cervical rib with stroke as the initial presentation. *Neurol Ind* 2010; 58(4): 645-647. DOI: 10.4103/0028-3886.68691.
- Sandeep Sharma, Subhash Kumar. Case report: Cervical spinal cord signal changes in a case of adult-onset subacute sclerosing panencephalitis. *IJRI Ind J Radiol Imag* 2010; 20(3):202-204. DOI:10.4103/0971-3026.69358.
- Sandeep Sharma, Subhash Kumar, NK Mishra, SB Gaikwad. Cerebral miliary micro aneurysms in polyarteritis nodosa : Report of two cases. *Neurol Ind* 2010; 58 (3): 457-459. DOI: 10.4103/0028-3886.65840.
- Amit Dagar, Manish K Kashliwal, Ashish Suri, Subhash Kumar, Ajay Garg, Bhawani S Sharma. A rare case of metachronous double spinal dural arteriovenous fistula. *Neurol Ind* 2010; 58 (1): 154-155. DOI: 10.4103/0028-3886.60427.
- Sandeep Sharma, Subhash Kumar, Arvind Nanda, Edmond Moses. Case Report: Carotid-cavernous fistula due to aneurysmal rupture in a case of aortoarteritis with bilateral giant internal carotid artery aneurysms. . *IJRI Ind J Radiol Imag* 2009; 19 (4):308-310. DOI: 10.4103/0971-3026.57216.
- Subhash Kumar, Edmund Moses, NK Mishra, Arvind Nanda. Right Vertebral Artery Originating from the Aorta Distal to Left Subclavian Artery and Ending in Posterior Inferior Cerebellar Artery in a Patient with Moya-Moya Disease. *Clinical Neuroradiology* 2008; 18 (3): 187-190. DOI: 10.1007/s00062-008-8024-6
- S Kumar, AM Patel, DU Vaghela, K Singh, RN Solanki, HR Shah. The brain arterio-venous malformations (BAVMs): A pictorial essay with emphasis on role of imaging in management. *IJRI Ind J Radiol Imag* 2006; 16 (4):757-764. DOI: 10.4103/0971-3026.32341

- S Kumar, AK Shah, AM Patel, UA Shah. CT and MR images of the flat bone Osteochondromata from head to foot: A pictorial essay. *IJRI Ind J Radiol Imag* 2006; 16 (4):589-596. DOI: 10.4103/0971-3026.32277
- M Ravalji, S Kumar, AK Shah, DU Vaghela, GJ Makwana, K Singh. CT and MRI features of the typical and atypical intracranial hydatid cysts: Report of five cases. *IJRI Ind J Radiol Imag* 2006; 16 (4):727-732. DOI: 10.4103/0971-3026.32333
- AM Patel, DU Vaghela, S Kumar, UA Shah, AK Shah, HR Shah. A rare case of melorrrheostosis with articular involvement: MR appearance. *IJRI Ind J Radiol Imag* 2006; 16 (4):619-621. DOI: 10.4103/0971-3026.32283.
- UA Shah, AK Shah, S Kumar. Giant cell reparative granuloma of the jaw: A case report. *IJRI Ind J Radiol Imag* 2006; 16 (4): 677-678. DOI: 10.4103/0971-3026.32297
- AK Shah, MA Joshi, S Kumar. Bladder exstrophy - A case report. *IJRI Ind J Radiol Imag* 2006; 16 (1): 103-106. DOI: 10.4103/0971-3026.29062

### **Papers under peer review: 5**

- Feasibility of USG in diagnosing knee ligament injury (anterior cruciate ligament) as compared to gold standard MRI
- Ultrasound guided polidocanol foam sclerotherapy for treating venous malformations
- Image guided sclerotherapy of masseteric venous malformations
- Papillary Adenocarcinoma of the third part of the duodenum : a case report
- Endovascular coiling of a cystic artery pseudoaneurysm secondary to acute cholecystitis

### **Ongoing projects**

- Feasibility of USG in diagnosing knee ligament injury (anterior cruciate ligament) as compared to gold standard MRI
- Role of ultrasonography and colour Doppler in evaluation of vertigo in patients of neck pain
- Carotid intima-media thickness in subclinical hypothyroidism
- Percutaneous transhepatic biliary drainage in malignant biliary obstruction: complications and outcome
- Diagnostic accuracy of elastography in comparison to conventional sonography and FNAC/Biopsy in evaluation of breast lumps
- Sclerotherapy of slow flow malformations of the tongue
- A diagnostic evaluation of Ultrasound Elastography in comparison to histopathological nature of the affected tissue in subjects with Oral Sub Mucous Fibrosis

### **Papers orated in conferences:**

- Interventional Radiology in breast diseases. CME: BREAST IMAGING; 5th International Day of Radiology (IDoR). 8th November 2016; AIIMS Patna
- IMAGING THE BRAIN TUMOR. BICON-47. 47<sup>th</sup> Annual conference of Bihar state chapter of IRIA, 26/3/2017, Patna
- MR IMAGING OF WHITE MATTER DISEASES. 47<sup>th</sup> Annual conference of Bihar state chapter of IRIA, 26/3/2017, Patna

- IMAGING OF ORAL CANCER: KEY CONCEPTS. Oral Oncology Symposium; International Academy of oral oncology (IAOO); AIIMS Patna. 24<sup>th</sup> March 2017
- Image modalities and imaging protocols for the generation of 3D printable models of craniofacial structures
- MR evaluation of brainstem gliomas: study of 40 cases: IRIA 2006, Chennai.
- MR evaluation of CP angle lesions with role of MR in management: IRIA 2006, Chennai.
- MR features of 40 cases of intracranial meningiomas with emphasis of evaluation of the intratumoral mottling: IRIA 2006, Chennai
- A large retrospective study raising questions over the necessity of contrast CT against plain scan of the brain: RSNA 2006
- Varicocele: role of Color Doppler in management: RSNA 2006
- A rare case of porencephaly with seizures, DNA meeting, 2008
- Endovascular management of complex intracranial aneurysms: 12<sup>th</sup> annual conference of ISVIR, New Delhi, 2009
- A rare case of hematomyelia, DNA meet, 2009
- Spinal Vascular Malformations – AIIMS Experience, Symposium Neuroradiologicum, Bologna, 2010

### **Poster presentations :**

- A case of congenital lobar emphysema: CME 2005, Karamsad.
- Imaging of pulmonary hydatid cysts: a pictorial review: CME 2005, Karamsad.
- Imaging of intracranial ependymomas: study of 40 cases: IRIA 2006, Chennai.
- CT and MR features of a case of ruptured intracranial dermoid cyst: in IRIA 2006, Chennai.
- Parenchymal arteriovenous malformation of the brain- imaging findings in 40 consecutive cases: IRIA 2006
- A Rare cause of intracranial bleed: Polyarteritis nodosa; ISVIR 2009
- Cervical rib with stroke as the initial presentation; ISVIR 2009
- Upper extremity deep venous thrombosis *vis-à-vis* central venous catheter: Need for risk factor awareness – A Case Report. 2nd ASNACC & 12 ISNACC, 2011

### **Conferences attended:**

- Annual IRIA conferences in Chennai 2006 and Mumbai 2007.
- Neuroradiology MRI conference, 2006, Nanavati Hospital.
- Clinical practice guidelines for evidence based management in vascular and interventional radiology, 2008, ISVIR, New Delhi.
- 12<sup>th</sup> annual conference of ISVIR, New Delhi, 2009
- 6<sup>th</sup> Delhi course on neurointervention 2011, Greater Noida.
- CMEs:
- Chest and breast imaging, 2005, Karamsad.
- Paediatric oncoradiology and breast imaging, 2005, GCRI, Ahmedabad
- CME on Fluorosis, 2005, Ahmedabad

- Mother and child imaging, 2006, GCRI, Ahmedabad.
- CT CME, Nair hospital, 2006, Mumbai.
- MR CME, Nair Hospital, 2006, Mumbai.
- Annual meet of Rajasthan branch of IRIA, 2006, Kota: CME on obstetrics, gynecology and pediatric imaging.
- 2<sup>nd</sup> annual conferences STNI 2017: Kovai , 2-4 March 2017
- CME: BREAST IMAGING; 5th International Day of Radiology (IDoR). 8th November 2016; AIIMS Patna
- BICON-47. 47<sup>th</sup> Annual conference of Bihar state chapter of IRIA, 26/3/2017, Patna
- Oral Oncology Symposium; International Academy of oral oncology (IAOO); AIIMS Patna. 24<sup>th</sup> March 2017
- Epilepsy in Children (EPIC): Challenges. 29th January 2017, AIIMS Patna
- Mentor Mentee Workshop. 1st & 2nd October 2016, AIIMS Patna
- Training on ethics committee procedures and software solutions for ethics committees and clinical researchers in India, May 6-7, 2016, Mumbai.
- Scope and Application of 3D Printing in Maxillofacial Surgery. 10/4/2016, AIIMS Patna

**All India Institute of Medical Sciences (AIIMS), Patna**, is one of the new AIIMS institutes being setup under the Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) and is planned to be a tertiary care institute with 960 beds. Currently the institute is running its 4<sup>rd</sup> batch of MBBS and 3<sup>rd</sup> batch of BSc nursing classes. A 180 beds hospital is also running. Department of Radiodiagnosis has two faculty and runs radiography, ultrasound, Doppler, mammography, CT scan and interventional radiology work. The department boasts of state of the art equipment including full room Digital Radiography unit, 256 slice Dual source CT scanner, 4D ultrasound, ECHO cardiography with TEE, Biplane DSA, and Digital mammography with stereotactic biopsy. 3T MRI. Gamma camera and Digital Fluoroscopy units are in the process of establishment. Postgraduate course is planned.

**Sri Balaji Action Medical Institute, New Delhi**, is a tertiary care center with 400 beds and is one of the twin hospitals, the other being the Action Cancer Hospital. I have setup the department of Interventional Neuroradiology in the hospital. I worked in close integrity with the departments of neurology, neurosurgery and radiology, going through the imaging of each in-patient, going on rounds together with the clinicians and taking management decisions. Wherever required,

angiograms or intervention is planned and performed. A dedicated 13 bed stroke ICU exists for the neurovascular patients. The cathlab is equipped with a Siemens flat panel DSA machine, and another flat panel GE machine with 3D angiography facility, and the hospital boasts of a 1.5T GE MRI machine, 64 slice GE CT machine, SPECT and PET- CT. I ran my own OPD, admit and manage neurointervention patients. The entire range of neurointerventional procedures were performed at our center. I have started weekly neuroradiology meet, and also performed transcranial doppler in the institute, having started the *CLOTBUST sonothrombolysis* for acute stroke patients.

**Max Superspeciality Hospital, New Delhi, India**, is a chain of tertiary care hospitals with over 1000 beds and now running paperless with HIS and an EHR. The department of Interventional Neurology has its own ICU and ward and has three consultants with five fellows. The department runs an international neurointervention fellowship program. Consultants run the OPD, manage ward, perform all procedures in the cathlab as well as take part in the academic program. Neurointervention Cathlab has a Siemens flat panel detector DSA machine with 3D angiography and roadmapping facility with latest Syngo software platform. Average 500 cases a year are performed, and include all types of neurointerventional procedures including diagnostic cerebral and spinal angiograms, extracranial as well as intracranial angioplasty and stenting, aneurysm coiling, AVM and DAVF embolisation etc.

**Department of Neuroradiology, All India Institute of Medical Sciences (AIIMS), New Delhi, India** caters to the Departments of Neurology and Neurosurgery primarily and boasts of world class MRI and Interventional Neuroradiology facilities.

Routine daily activities in the department include *12 MRI scans, 60-80 CT scans, 4-5 angiographies and interventional procedures* apart from radiographs, sonographs and Color Doppler examinations.

A dedicated *PACS* exists, well connected with Neurology and Neurosurgery departments. Academic activities include *daily conferences* with Neurologists and Neurosurgeons, weekly epilepsy meet, and biweekly Neuropathology conference.

Weekly thrice *Interesting Case discussion and Seminars* take place within the department.

Duration of experience in various modalities can be summed up as;

- *Cathlab*: 1.5 years—Approx. 1000 angiograms, small interventions and assisting major interventions
- *MRI*: 9 months---experience includes conventional MRI as well as higher MRI including *DTI and Functional Imaging*

- CT, USG and Doppler: 6 months

**Civil hospital, BJ medical college, Ahmedabad, Gujarat, India** has a PACS connected imaging department with MR, spiral CT, DSA, Color Doppler and three USG machines apart from many fluoroscopic and radiographic units. A separate trauma centre hosts another CT machine, an IITV and x-ray units.

Residents are rotated to Gujarat Cancer Research Institute which is a premier cancer research institute of Western India and has a separate DSA, MR and two CT machines.

The duration of experience in various modalities can be summed up as:

- Conventional radiography (including CR system): 3 months
- Barium Studies: 3 months
- IVP: 2.5 months
- Other procedures viz. MCU, RGU, HSG, Sinogram, Fistulogram etc: 2.5 months
- *Mammography*: 1 month
- Ultrasonography and US guided interventional procedures viz. biopsy, drainage procedures etc.: 6 months
- *Color Doppler*: 2 months
- Spiral CT (including CT angiography, HRCT of temporal bone and chest): 6 months
- *MRI*: 6 months (0.5T machine; exposure of MR brain and spine chiefly, with some experience of abdomen and musculoskeletal MR)
- *Angiography*: Chiefly diagnostic –cerebral, peripheral and renal and some therapeutic work including bronchial artery embolisation, angioplasty: 3 months; total no of angiographies done – approx 40)