·述 评 Comment·

重视儿科介入放射学

朱 铭，程永德

介入放射学在儿童疾病的诊治中有广泛的用武之地。儿科介入放射学是介入放射学的一个分支学科，也是儿科放射学的一个分支学科。儿科介入放射学在近 30 年来发展迅速，在发达国家，儿科介入放射医师现在与儿童内、外科医师紧密合作，诊断和治疗范围广泛的各种儿童疾病。儿科介入放射学内容包括儿童心脏介入放射学，儿童神经介入放射学，儿童血管介入放射学，儿童非血管介入放射学，儿童肿瘤介入放射学等[1-5]。在美国，每所 200 张床位以上的儿童医院中，都有专门从事儿科介入放射学的医师，放射科都有自己专用的 DSA 血管造影设备。在这些医院中每年都实施越来越多的儿童血管造影检查和儿童介入治疗，大大提高了儿童先天性和获得性疾病的诊疗水平，其效果令人鼓舞；许多儿童介入治疗方法已替代外科手术或成为外科手术的重要补充和辅助手段。与发达国家相比，我国的儿科介入放射学还刚起步：我国绝大多数儿童医院没有专门从事儿科介入放射学的医师；没有放射科专用的 DSA 血管造影设备。与成人介入放射学相比较，我国儿科介入放射学与先进国家的差距要大得多。在儿科介入放射学的各分支中，主要由放射科医师操作的儿童神经介入，儿童血管介入，儿童非血管介入等与发达国家的差距更大。主要由小儿心内科医生负责操作的儿童心脏介入放射学在国内开展得相对比较普及：儿童先天性心脏病心血管造影诊断，儿童先天性心脏病心血管介入治疗如心脏瓣膜和血管狭窄的球囊扩张术，侧支血管、动脉导管未闭和动静脉瘘的弹簧钢圈填塞术，房间隔缺损、室间隔缺损、动脉导管未闭装置封堵术以及心律失常射频消融术等在国内均以开展，但国内儿科放射学医师一般并不操作心脏介入治疗，主要负责儿童先天性心脏病心血管造影的读片诊断。

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我国的儿科介入放射学发展不如人意有其复杂的历史根源和客观原因。在我国儿童患者主要在专科的儿童医院就诊，设备条件和人才力量强的综合性三级甲等医院中儿童患者并不多，很难要求这些医院在儿科介入放射学上投入较大的力量。而儿童患者集中的各地专科的儿童医院由于医疗保险的体制问题，由于以往的儿童收费价格和财政补贴问题以及医院的经济实力、设备条件等原因，介入放射学的发展相对较为滞后。如 5 年前，我国绝大多数儿童医院放射科没有 DSA 血管造影设备，而当时综合性医院放射科都已有 DSA 血管造影设备，在没有一定设备条件的情况下，要开展儿科介入放射学确实也很困难。这一切造成了我国儿科介入放射学的发展现状。

近年来，随着我国经济的快速发展，各地政府对卫生资源投入也有增加，各地专科儿童医院的医院规模，经济实力和设备条件也有了大幅度的改善，600～800 张床位的专科儿童医院在全国已有多所，不少专科儿童医院已拥有磁共振和多层螺旋 CT 等先进的影像设备，添置 DSA 心血管造影机已不再是很困难的问题。如果考虑医疗设备的成本-效益，应当让儿童心血管造影和外周血管造影使用同一台心血管造影机。儿童外周血管造影不像成人外周血管造影需要使用大尺寸影像增强器的造影设备或大平板直接数字化造影设备，9～12 英寸影像增强器的心血管造影机或小平板直接数字化造影设备已足够，故完全可与心血管造影检查共用同一台设备。目前由于非离子对比剂的广泛使用，一般毋需使用昂贵的双向心血管造影机。无论如何，目前广泛开展儿科介入放射学的条件已经成熟，如果我们这一代儿科放射学医师还不能抓住机遇将儿科介入放射学工作开展起来，将会愧对后代。

要开展儿科介入放射学工作不仅要解决设备问题，还要考虑人才和人员培养问题。可以将有志于介入放射学的儿科放射学医师送到开展介入放射学较好的综合性三级甲等医院中去学习，虽然儿童介

入比成人介入操作难度更大，风险更高，其适应证、禁忌证和并发症与成人也不尽相同，但动脉穿刺，导管操纵，球囊扩张，血管堵塞等基本的介入放射学技巧在成人和儿童都是类似的。此外，如果所在的儿童医院已经开展儿童心血管造影检查，也可让儿科放射学医师向小儿心内科医师学习介入放射学基本技巧，心内科医师所用的介入放射学基本技术和原理与儿科外周血管介入放射学也是大同小异的。当然，如有可能，选送儿科放射学医师去国外进修也是很有效的人才培养手段。另外，做一些动物血管造影对学习和理解儿科介入放射学也很有帮助[6]。

要开展儿科介入放射学工作，还必须要得到儿童内外科医师，麻醉科医师和其他临床科室医师的支持和配合，儿童介入和血管造影通常要在镇静和麻醉下进行，必须由麻醉科医师配合[7]。

儿科介入放射医师的工作超越了传统放射科医师的诊断范围，进入了风险更高的治疗领域，儿科介入放射医师不仅要完成介入操作，更要培养自己成为合格的临床科室的成员。在当前，临床医师的支持对儿科介入放射工作的开展至关重要。

目前儿科介入放射学正迅速发展，新的方法如磁共振引导下的儿科介入放射学[8]等新技术正在进入临床，我们必须抓住机遇迎头赶上。

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Attention for pediatric interventional radiology

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Radiological interventions possess wide utilization in the diagnosis and treatment for pediatric patients. Pediatric interventional radiology is an important branch of interventional radiology and also an important branch of pediatric radiology. Pediatric interventional radiology has grown substantially over the last 30 years, radiologists closely cooperation with surgeons and other physicians providing a new horizone in the management of pediatric diseases in western countries. It includes pediatric cardiac interventional radiology, pediatric neuro-interventional radiology, pediatric vascular interventional radiology, pediatric nonvascular interventional radiology, pediatric tumor interventional radiology and others[1-5]. In the United States, every children hospital which owns two hundred beds has to have special trained interventional radiologists in radiologic department installing with advanced digital subtraction angiographic equipments. Interventional therapeutic procedures and diagnostic angiography have been proceeding more and more for the congenital and acquired diseases of children. The promising results give use uprising and interventional therapy as an alternative or a replacement or supplement to surgical operation. Pediatric interventional radiology is rather underdeveloped in China with a few special pediatric interventional radiologist, lack of digital subtraction angiography equipment. Pediatric radiologists have no enough field for interventional procedures such as pediatric neuro-interventional radiology and pediatric vascular interventional radiology. In the contrary adult interventional radiologists do have better interventional

jobs in China and Pediatric cardiologists also share the same trend. They perform angiocardiography for congenital heart diseases and treat congenital heart disease with interventional procedures including balloon dilation of valves and vessels, coil embolization of collaterals, patent ducts and other arterial fistulae; devices closure of atrial septal defect , ventricular septal defect and patent ducts; and radiofrequency ablation of arrhythmias and others. Pediatric radiologists usually only take the responsibility for diagnosis of angiocardiography and don't take part in cardiac interventional procedures in most children's hospitals of China.

The problem of underdevelopment of pediatric interventional radiology in China possesses a lot of reasons, even historical. Most of pediatric patients are confined in children's hospital with shortage of advanced equipment and enough pediatric interventional patients due to the old price system, the old medical insurance system and old financial support system, outcoming with the economic condition of most children's hospital be more inferior than the adult general hospital.

In recent years, along with the rapid development of Chinese economics, children's hospitals have been improved obviously with more than 600 beds to 800 beds equipping with advanced muti-detecter CT, high magnetic field resonance imaging sets and sometimes even with a new DSA machine. On account of economics, pediatric interventional radiologists and pediatric cardiologists can share the same set DSA machine with small size (9-12 in.) imaging amplifier or small digital plate equipment fullfilling their necessities. Therefore one set of DSA machine as single plane DSA machine usually is enough for pediatric interventional radiology and cardiac interventional procedures. However, meanwhile is the best time for developing pediatric interventional radiology otherwise we would lose the best chance.

Not only the need of equipment but also the need of experienced doctors arouse us to have training of pediatric interventional radiologists at adult interventional radiologic department of general hospitals. Pediatric interventional radiology is more difficult and dangerous than the adults, including the indications, contraindications and complications[6], but the basic techniques such as femoral artery puncture, catheter manupulation, balloon dilation and coil embolization are similar. Another way of training pediatric interventional radiologist is at the pediatric cardiac department of children's hospital. The basic techniques of cardiac interventional therapeutic procedures are similar with those of the peripheral interventional radiology procedures. Furthermore pediatric radiologists could have a chance to be sent abroad for studying pediatric interventional radiology. Experimental animal percutaneous approach angiography is also very helpful for understanding pediatric interventional radiology.

To develop pediatric interventional radiology, radiologists should cooperate with pediatricians, pediatric surgeons, anesthetists and other clinical doctors becouse of sedation and general anesthesia are always taken place for pediatric interventional procedures especially. Ketamine should be familiarit by anesthetists in order to keep away any events[7]. The pediatric interventional radiologists venture beyond the realm of diagnostic imaging just as entering the arena of patient treatment. They need a lot of helps from peri-interventional staffs before and after the proceduce.

Pediatric interventional radiology is developing quickly with MR-guided interventions and other new techniques[8]. We must pay more attention to this important field, otherwise we will be lagged behind and lose the very fruitful achieving apportunity.

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