Interventional Radiology: new procedures

Alex M Barnacle

Consultant Interventional Radiologist
Great Ormond Street Hospital for Children, London, UK

Interventional radiology (IR) is well established as a key resource in adult healthcare, forming the mainstay of treatment for peripheral, aortic and neurovascular arterial disease and increasingly taking centre stage in other specialties such as trauma, oncology, urology, hepatobiliary and musculoskeletal disease. In comparison, the application of interventional radiology has lagged significantly behind in paediatric services. This has occurred for a variety of reasons, including the absence in paediatrics of the large volume of peripheral vascular work that drove innovation in adult practice, the lack of paediatric-specific equipment and technology, the complete absence of paediatric training programs and, undoubtedly, a lack of vision on the part of both clinicians and hospital management.

Despite these issues, IR is now beginning to emerge as a respected, innovative and central player in paediatric healthcare. Having shown that percutaneous image-guided central venous access has lower complication rates than traditional surgical approaches and better results in terms of technical success rates and long term outcomes for venous access, paediatric IR is now well-respected for its role in vascular access and many centres may consider this to be IR’s central function. But the value of IR is far wider than vascular access. Innovative centres that have embraced and encouraged development of IR skills have shown that the specialty quickly becomes invaluable in other areas. The reach of IR in paediatrics now stretches to the management of renovascular hypertension, congenital airway disease, vascular anomalies, oncology, renal stone disease and gastrointestinal intervention.

This lecture will discuss a number of recent paediatric IR developments, highlighting the central role of anaesthesia in delivering these services safely and successfully.

The management of congenital airway disease provides an exciting challenge for cardiothoracic surgeons, interventional radiologists and anesthetists. In our centre, the focus has moved from surgery to IR over time, with IR playing a central role in the diagnosis of complex airway abnormalities and in the non-surgical management and post-surgical follow-up of these patients [1,2].

IR embolisation skills traditionally used in the vascular system have recently been applied to other conditions that have historically been within the remit of cardiothoracic surgery. Embolic agents and transcatheter approaches are being used in innovative ways to treat bronchopleural fistulae and chylothoraces that have failed standard medical and surgical intervention [3,4].

IR is well known for its practical role in transarterial work, delivering embolic agents such as coils or glue to control bleeding and block abnormal vasculature. However, these vascular techniques are increasingly being used to deliver agents other than embolic material via the arterial system. In adults and children this allows, for instance, novel chemotherapy delivery procedures for primary and metastatic hepatic malignancy. More recently, IR is now offering chemotherapy delivery via the ophthalmic artery for the treatment of retinoblastoma, a procedure that has revolutionised the management of this disease, but not without significant challenges for our anaesthesia colleagues [5].
In many cases, paediatric IR is exploring novel techniques to manage paediatric-specific diseases. But some conditions, such as renal stone disease and venous thrombosis, present similar demands in both adults and children. Here, the role of IR may seem well defined, applying tried and tested techniques that have been well established in adult practice. However, even here, the challenges are interesting. In both examples given above, the available equipment and technology is often not suited to performing these procedures safely or successfully in children and in some centres, enthusiastic adult clinicians have tried to treat children as mini-adults with little regard for the uniquely paediatric challenges involved. In reality, these should be fascinating fields to develop, learning from the expertise and innovation of our adult colleagues, while bringing our unique paediatric skills to the table [6-9]. Anaesthetists should be wary of buying into procedures that have not been fully adapted to a paediatric setting.

Without strong support from anaesthesia, the development of paediatric IR would not be possible. In children’s hospitals in North America and Europe, IR is now increasingly recognised as a central resource alongside the surgical specialties and is demanding a share of theatre resources and anaesthetic services. In our experience within a busy tertiary centre, IR manages some of the sickest children in the hospital, often being asked to intervene on an emergency basis when a patient’s clinical status is deteriorating. Many of these cases present significant anaesthetic challenges. As IR evolves, even the ‘routine’ or planned procedures it offers are becoming more complex and often carry significant risk, requiring skilled anaesthetic management. It is crucial to emerging IR departments that our anaesthetic colleagues understand what we can offer and help us to develop our services successfully and safely.

References:


