Ultrasound placement of peripherally inserted central catheters (PICCs) in adults with cystic fibrosis

Chronic Pseudomonas aeruginosa infection occurs in more than 85% of adults with cystic fibrosis. Recurrent courses of intravenous antibiotics are required to treat pulmonary exacerbations and the establishment of reliable intravenous access is necessary. Administration of multiple courses of antibiotics may require the insertion of long line or central venous catheters. Totally implanted venous devices are reserved for patients where alternative access is not feasible. Peripherally inserted central catheters (PICCs) are increasingly used for the administration of antibiotics and chemotherapy. Ultrasound has been reported to assist the successful placement of PICC lines. We report our experience with the use of ultrasound to assist the placement of PICC lines where access has been difficult, using a standard technique via the antecubital fossa. During the past 23 months a total of 124 PICC lines have been inserted in patients with cystic fibrosis (clinical population 110). In a subgroup of patients 22 placements of the PICC have been guided by ultrasound. The criteria for the use of ultrasound include inability to access the vein via the antecubital fossa by an experienced anaesthetist or ICU consultant; inability to advance the catheter due to venous obstruction; and other viable venous access. The procedure was performed by an interventional radiologist and ultrasonographer with the catheter inserted in the basilic or brachial vein in the upper arm. Ultrasound was used to select which vein to access and was determined by vein position (not lying superficial or adjacent to artery), caliber (>2 mm diameter), and tortuosity (straight). The position of the catheter was confirmed by fluoroscopy.

We retrospectively reviewed PICC insertion utilising ultrasound. In all patients the PICC line was inserted successfully. The mean catheter dwell time was 17 days (range 9–51, median 14). No catheter sepsis, obstruction, or breakage have been documented and one localised thrombus within the axillary vein was detected 12 days after insertion (symptoms resolved completely on PICC removal). Venous access may be difficult in patients with cystic fibrosis who require regular antibiotic therapy. Infection, occlusion, or erosion through the skin may complicate totally implanted venous devices. Ultrasound guided placement of a PICC may be used as a bridge to the insertion of a totally implanted venous access device, but does require the expertise of an interventional radiologist and ultrasonographer.

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Screening for polymorphisms in exon 5 of the glutathione S-transferase PI gene

A recent paper by Ishii et al suggested an association between glutathione S-transferase PI (GSTP1) polymorphism in exon 5 (Ile105Val) and the development of chronic obstructive pulmonary disease (COPD) in a sample from a Japanese population. The authors reported that GSTP1 homozygous wild type Ile105 polymorphism was found more frequently in patients with COPD than in controls (79% vs 52%).

In an ongoing COPD genetic study (unpublished preliminary results) we determined the prevalence of GSTP1 polymorphism in exon 5 in 200 healthy volunteers from the Barcelona area. Genetic variants were detected using polymerase chain reaction (PCR) and restriction fragment length polymorphism (RFLP). The amplification products were digested with the restriction enzyme BsmI at 55°C, subjected to electrophoresis, and visualised by ethidium bromide staining. Of the 200 healthy volunteers, 99 (49.5%) were homozygous wild type Ile105 (additionally, 88 (44%) were heterozygous Ile105Val and 13 (6.5%) were homozygous Val105). This percentage was similar to that observed by Ishii et al in Japan and Harries et al in a Caucasian population in the UK, but differed strongly from that observed by Morita et al in Japan and Lieshout et al in a Caucasian population in the Netherlands.

We now report the successful application of PCR and single strand conformation polymorphism (SSCP) to the rapid detection of Ile105Val genotypes. DNA was isolated from EDTA blood samples using the QIAamp Kit (Qiagen Ltd, Crawley, UK). Gene specific primers to amplify a 190 bp fragment (5'-CTCTATGGGAAGGACCAGCA-3' and 5'-CTGACTGTCTTGCACATCCT-3') were designed from the GSTP1 sequence (Genebank U12472). The PCR reaction was performed as previously described. The SSCP procedure and silver staining were carried out according to the manufacturer's instructions (Pharmacia Biotech, Sweden) with the following modifications: samples were denatured at 95°C for 15 minutes and electrophoresed at 200 V for two hours.

Using serum samples from 100 healthy volunteers, we compared in a blind experiment the results obtained by this method with those obtained by PCR-RFLP analysis. In all cases identical genotypes were obtained. Moreover, GSTP1 polymorphisms were confirmed by direct sequencing analysis of individuals predicted to be Ile105, Ile105Val, and Val105 from the assay results using a previously reported PCR sequencing method. Figure 1 shows the results obtained with PCR-SSCP and PCR-RFLP.

Studies on large series are required to investigate further the pronounced interethnic differences in allicle frequencies in exon 5 of the GSTP1 gene in normal populations. The simple PCR-SSCP method we propose, with comparable sensitivity and specificity to that obtained with the PCR-RFLP method, could be useful for GSTP1 genetic screening. PCR-SSCP is a
This book is a theoretical and practical overview of pulmonary function testing. As such it caters both for clinicians and technicians involved in the gathering of data and its interpretation.

Having evolved from the well renowned Hammersmith Hospital course on Clinical Applications of Pulmonary Function, this volume draws on the experience and expertise of its many contributors. They have successfully developed a textbook that takes its readers from the physiological basis of all aspects of pulmonary function testing, through the mechanical limitations of measurement techniques, aspects of evaluation of breathlessness and breathing control, to the often neglected areas of interpretation and presentation of results. All this is produced in a format made relevant to clinical practice.

The authors adeptly express complex dynamic principles in word form and have supplemented this text with considered, well constructed graphs, tables and illustrative diagrams which underline and clarify the points made. There are frequent highlighted “bullet point” text boxes and succinct chapter conclusions to allow the reader access to clear summaries of the issues discussed in each section.

A section including chapters devoted to the less routine aspects of lung function testing including sleep disorders breathing, paediatric pulmonary function, pulmonary function testing in the intensive care unit, and domiciliary oxygenation and assisted ventilation demonstrates the potential and scope that this field has to offer.

Being accessible and clearly composed, the text has the potential to be used as a “reference manual” but its editors have steered the emphasis towards promotion of a comprehensive understanding of the theory behind commonly used pulmonary function tests which is where its great strength lies.

This should allow readers to develop a pragmatic, efficient approach to the appropriate use of the tests discussed, together with a realistic and clinically applicable basis for the interpretation of their results.

This book comes thoroughly recommended to technicians and respiratory physicians alike, and goes a long way towards revitalising an important area of respiratory medicine which is unfortunately in danger of being overlooked as our attention is taken by newer scientific advances.— ILJ

Therapeutic Applications of Leukocyte Filtration

A one-day workshop on Therapeutic Applications of Leukocyte Filtration organised by Professor Ken Taylor and Dr Terry Gourlay will be held at the Hammersmith Hospital, Imperial College, London on 7 July 2000. For further details and registration forms contact Jean Bryant, Manager, Wolfson Conference Centre, Imperial College of Science Technology and Medicine, Hammersmith Hospital, Du Cane Road, London W12 ONN, UK. Telephone: 44 (0)208 383 3111 Fax: 44 (0) 208 383 2428. Email: wcc@rpm.ac.uk