SA Journal of Radiology
ISSN: (Online) 2078-6778, (Print) 1027-202X

Technical report: 'Flat earth lung' a curved multiplanar reconstruction for demonstration and follow-up of scattered metastatic lung nodules in children

Authors:
Sarah Arthur[1]
Savvas Andronikou[2]

Affiliations:
[1]Department of Paediatrics, Severn Deanery, United Kingdom

[2]Bristol Royal Hospital for Children, University of Bristol, United Kingdom

Corresponding author:
Sarah Arthur,
sarah.arthur@doctors.org.uk

How to cite this article:
Arthur S, Andronikou S. Technical report: 'Flat earth lung' a curved multiplanar reconstruction for demonstration and follow-up of scattered metastatic lung nodules in children. S Afr J Rad. 2017;21(1), a1153. https://doi.org/10.4102/sajr.v21i1.1153

Background: Lung metastases from paediatric Wilms tumour and osteosarcoma are currently diagnosed and presented to multidisciplinary medical teams using cross-sectional computer tomography (CT) slices. Clear demonstration of the extent, distribution and progression of lesions can direct medical and surgical interventions. For non-radiologists, viewing and appreciating the state of the multifocal metastatic disease in a plethora of on-screen images and from text reports can be very difficult. Innovative thinking to condense multiple cross-sectional slices into visually comprehensible images is crucial to ensure important information is accurately communicated and further aid clinical decision-making.

Aim: To describe a novel CT curved reformatting technique to generate a standardised single image of the lungs that demonstrates pulmonary metastases.

Methods: We describe a simple reconstruction technique using the curved reformatting function on OsiriX freeware, to flatten out the peripheral lung parenchyma into a single image much like a map of the world represents the outer surface of the earth. We provide examples that demonstrate multifocal peripheral lesions and the normal anatomy simultaneously in one image. In addition, we demonstrate the use of minimum intensity projection (MinIP) views for higher accuracy, pitfalls and future applications.

Conclusion: Generating curved multiplanar reconstructions of the lung can aid clinical decision-making and disease progression by accurately representing pulmonary metastases in children via a single image. This quick, easy and systematic technique, aptly named 'flat earth lung', negates the need to scroll through cross-sectional CT scans and can be utilised in multidisciplinary team meetings and multimedia reports. Further uses extend to case note illustration for communication between colleagues.

Note: A selection of conference abstracts: RSSA/SASPI Paediatric Imaging Congress, 03–06 November 2016, Spier Estate, Stellenbosch, South Africa. Faculty collaborators: Professor Kassa Darge (Body Imaging, University of Pennsylvania, Philadelphia, USA), Professor Edward Lee (Thoracic Imaging, Harvard University, USA), Professor Beverley Newman (Cardiac Imaging, Stanford University, California, USA), Professor Kimberly Applegate (Image Gently and Body Imaging, Emory University, Atlanta, USA) and Professor Savvas Andronikou (Thoracic Imaging, University of Bristol, UK) supported by South African Paediatric Radiologists, co-ordinated by Dr Jaishree Naidoo, President of the African Society of Paediatric Imaging and Head of Division of Paediatric Radiology, Charlotte Maxeke Johannesburg Academic Hospital.