

# Bronchiolitis obliterans organising pneumonia in a young child associated with respiratory syncytial virus: a case report

Norbertta Washaya<sup>1</sup>, Shivani Singh<sup>2</sup>, Komala Pillay<sup>2</sup>, and Marco Zampoli<sup>1</sup>

1: Department of Paediatrics and Child Health, Red Cross War Memorial Children's Hospital, University of Cape Town, Cape Town, South Africa

2: Division of Anatomical Pathology, Department of Pathology, Red Cross War Memorial Children's Hospital, University of Cape Town, Cape Town, South Africa

## Introduction

Bronchiolitis obliterans organising pneumonia (BOOP) is a rare form of idiopathic interstitial lung disease in children.<sup>1,2</sup> Standard treatment and follow up guidelines in children for BOOP are extrapolated from adults.

We describe a case of BOOP in a child with successful treatment and good outcome which adds knowledge to literature on BOOP in children.

## Case summary

A previously well, 2.5-year-old male presented with a 2-month history of worsening cough, shortness of breath and weight loss.

He first presented similarly two months prior with PCR confirmed respiratory syncytial virus (RSV) and rhinovirus associated pneumonia. He was HIV exposed but uninfected. He had no history of neonatal respiratory distress and no family history of respiratory illnesses. Except for household tobacco smoke exposure, no other environmental exposures were reported.

On physical examination, he was hypoxic in room air (SpO<sub>2</sub> 82%) and tachypnoeic (80 bpm). Bronchial breath sounds were noted on auscultation, worse on the right. Cardiac examination was normal and there were no signs of pulmonary hypertension. He was not clubbed, and no signs of systemic illness were present.

## Investigations

Chest x-ray demonstrated bilateral diffuse air space opacification (figure 1). CT chest showed bilateral extensive confluent consolidation with interspersed and surrounding areas of ground glass opacification (figure 2).

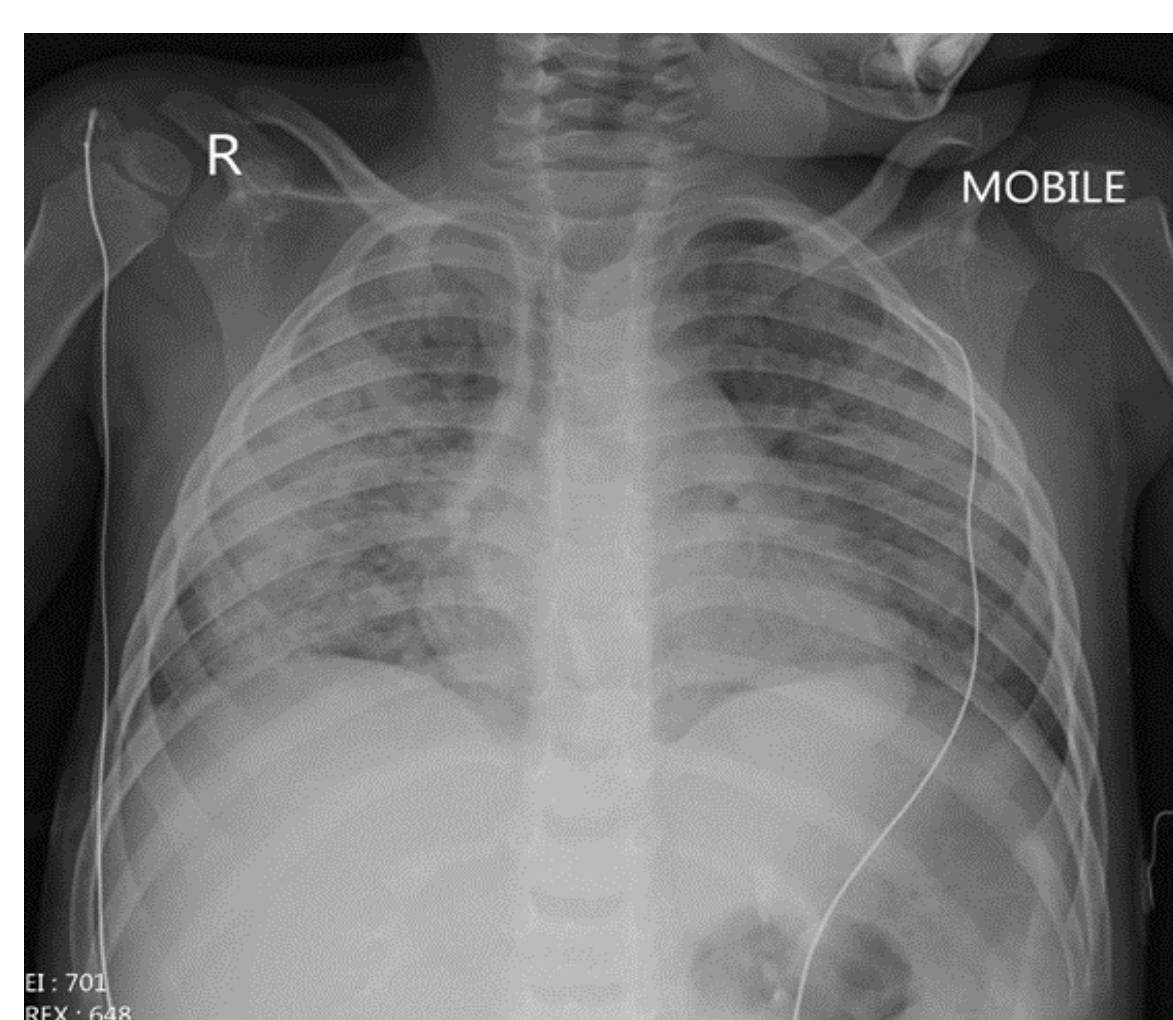


Figure 1



Figure 2

Special investigations are presented in table 1. Lung biopsy was performed and demonstrated a BOOP pattern with fibrosis (figure 3).

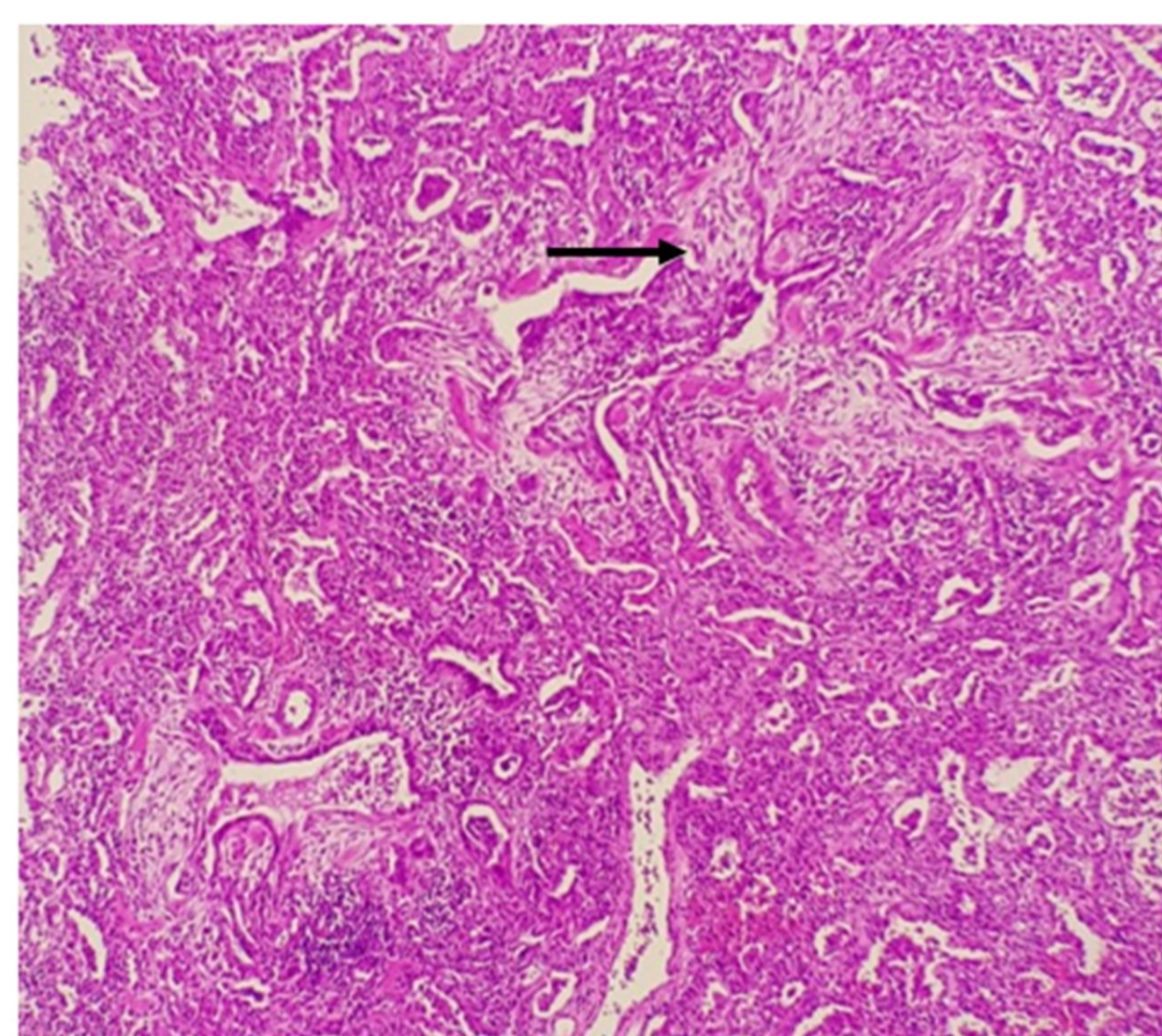


Figure 3 : Low power view showing fibroblastic plugs noted within the bronchiolar lumina. There is interstitial expansion by chronic inflammation and organisation.

Table 1

Test	Result	
C reactive protein	21 (highest value)	
Procalcitonin	0.13	
White cell count	14.37 X 10 <sup>9</sup> /L	
WCC differential	Neutrophils 77.3%	
	Lymphocytes 18.4%	
	Monocytes 3.5%	
	Eosinophils 0.4%	
	Basophils 0.1%	
	Immature cells 0.3%	
Haemoglobin	11.6g/dL	
Mean corpuscular volume	74fL	
Platelets	471 X 10 <sup>9</sup> /L	
Anti-nuclear IgG	Negative	
SARS-CoV-2 PCR	Negative	
SARS-CoV-2 antibodies	Negative	
CMV viral load	Lower than detectable limit	
Blood culture	No growth after 5 days	
Broncho alveolar lavage	Cytospin	Neutrophils 26% ;Lymphocytes 18%; Macrophages, Histio-, Monocytes 56%
	Respiratory viruses multiplex PCR*	Negative
	PJP immunofluorescence	Negative
	CMV viral load	Negative
	Microscopy and culture	Negative for bacteria, fungi and TB
Xpert MTB/Rif Ultra	Negative	

\*Detects: adenovirus, influenza A, Influenza B, Human metapneumovirus A/B, Parainfluenza 1- 4, Respiratory sentential virus A/B and Human rhinovirus

## Management and outcome

He was treated with empiric broad spectrum antibiotics; IVI methylprednisone pulse 10mg/kg for three days; chloroquine, low-dose azithromycin; inhaled corticosteroids, cotrimoxazole and isoniazid prophylaxis and domiciliary oxygen

He was readmitted four weeks later with an exacerbation associated with worsening hypoxia and with parainfluenza type 1-4 and rhinovirus. A third 3 - day methylprednisolone pulse of 10mg/kg was given followed by additional oral prednisone dose of 1mg/kg/day three times weekly.

He was reviewed six weeks later and noted to have SpO<sub>2</sub> 97% in room air with partial resolution of disease on chest radiograph (figure 4).

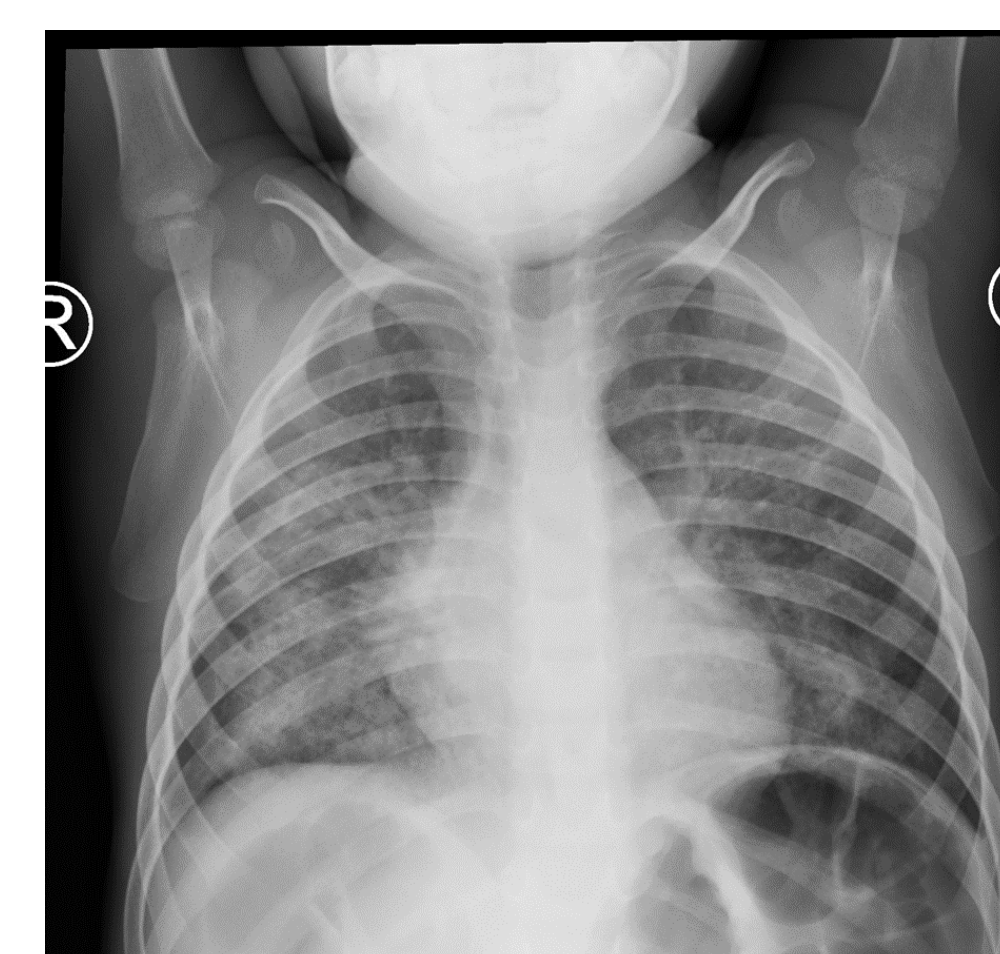


Figure 4

## Conclusion

This case reports the partial resolution of BOOP in a young child with previous RSV infection, who showed good response to systemic corticosteroids and other immune modulating agents. Further research to determine the aetiology and optimal treatment of BOOP in children is needed.

## Acknowledgements

African Paediatric Fellowship Program and Department of Paediatrics & Child Health Research Committee University of Cape Town for funding

## References

1. Bronchiolitis obliterans and BOOP: what relevance in pediatric?, Philippe Reix, available at [https://www.cipp-meeting.org/CIPPVIII/proceedings2008/CONTENT/2-SATURDAY\\_AFTERNOON/5-SP2A\\_FR\\_SESSION/2-Philippe\\_Reix.pdf](https://www.cipp-meeting.org/CIPPVIII/proceedings2008/CONTENT/2-SATURDAY_AFTERNOON/5-SP2A_FR_SESSION/2-Philippe_Reix.pdf). Accessed 31 May 2021
2. Cazzato S, et al, Bronchiolitis obliterans-organizing pneumonia: an Italian experience. Respir Med. 2000 Jul;94(7):702-8. doi: 10.1053/rmed.2000.0805. PMID: 10926343.



UNIVERSITY OF CAPE TOWN  
IYUNIVESITHI YASEKAPA • UNIVERSITEIT VAN KAAPSTAD

