

Mirror Syndrome: A differential requiring reflection when managing co-existing feto-maternal pathology

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Introduction

Mirror syndrome, also known as Ballantyne Syndrome, describes the presence of fetal hydrops associated with placental and maternal oedema. The oedema in the mother and fetus ‘mirror’ each other. The incidence of the syndrome is 1:3000 pregnancies but is thought to be underestimated due to confusion with pre-eclampsia.

Objective

To highlight a rare case of co-existing maternal and fetal pathology where management aimed at meeting the needs of both the mother and fetus risks morbidity and mortality

Fetal Ultrasound – 27+2 gestation

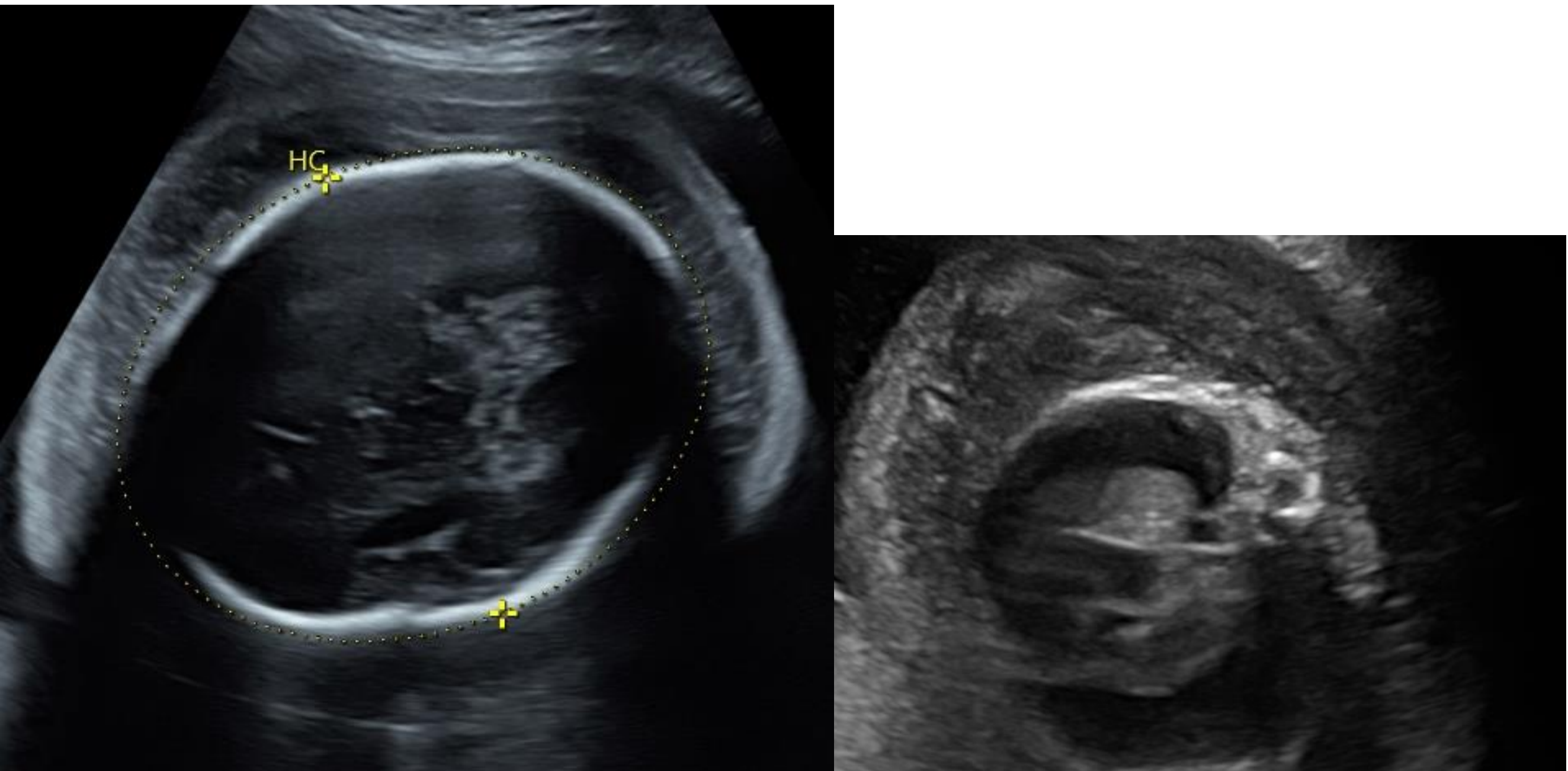


Figure 1. Head Circumference with evidence of subcutaneous oedema

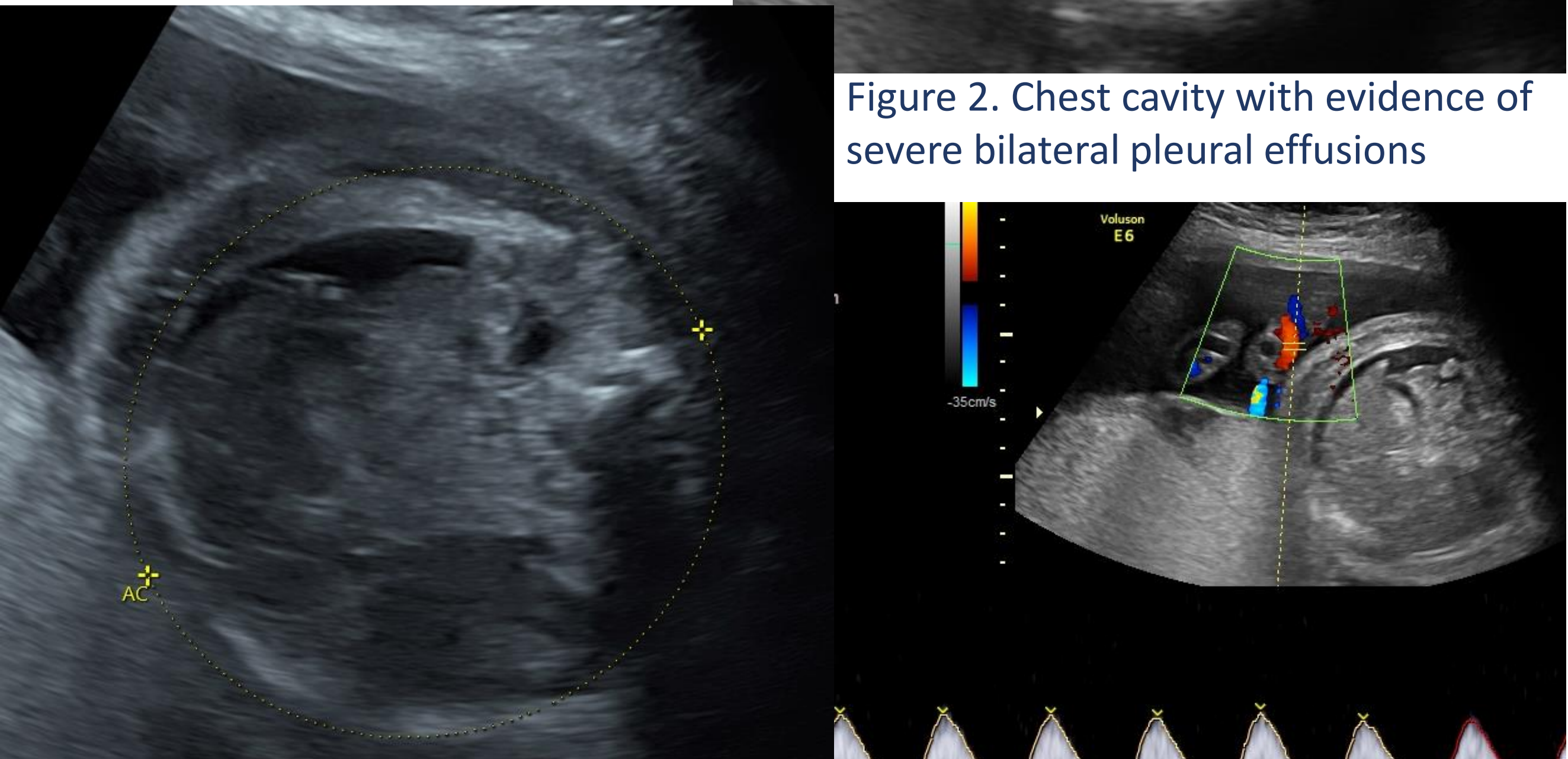


Figure 3. Abdominal Circumference with evidence of ascites and skin oedema

Figure 2. Chest cavity with evidence of severe bilateral pleural effusions

Figure 4. Umbilical artery doppler with intermittently absent end diastolic flow evident

Case Report

1st trimester/Early second trimester:
26 year old Primip. Low risk at booking assessment. 12+1 Dating USS - Increased Nuchal thickness (4.1mm). Amniocentesis offered and performed at 15+3 revealing normal female karyotype and microarray. Cytomegalovirus, toxoplasmosis and Epstein Barr virus negative. FASP 20+2 (Fetal Anomaly Screening Programme) revealed a cystic hygroma and mild hydronephrosis with plan for close review.

Maternal Acute Admission:
27+1. Admitted to delivery suite due to persistent vomiting for 14 days, generally unwell and reduced fetal movements. She was found to have deranged liver and renal function, thrombocytopenia and markedly raised LDH (Table 1). The patient was normotensive without the use of anti-hypertensives and UPCR was normal (24 mg/mmol) and hyperreflexia could not be demonstrated.

Fetal Ultrasound 27+2 (Figures 1-4):
Extensive cystic hygroma extending from neck down to abdominal wall, marked skin thickening, severe bilateral pleural effusions and ascites. Umbilical doppler assessment showed intermittently absent end diastolic flow and an elevated pressure index. Middle cerebral artery doppler demonstrated evidence of redistribution. Mild polyhydramnios (Deepest vertical pool 8.5cm) was present. Overall ultrasound was suggestive of severe non-immune fetal hydrops.

Ongoing Inpatient stay:
Rapid maternal deterioration occurred over a 24 hour period, with oliguria, worsening biochemistry, severe peripheral and pulmonary oedema (Figure 5) requiring Furosemide therapy. A diagnosis of mirror syndrome was established and with in-utero optimisation of the fetus not a option due to non-immune hydrops, delivery in largely the maternal interest was recommended with a high chance of fetal mortality predicted.

Delivery and postnatal period:
A surgically uneventful caesarean section was performed at 27+3, with subsequent neonatal death at 28 minutes of age largely attributable to airway oedema preventing adequate intubation and ventilation. Maternal condition, both clinically and biochemically improved postnatally despite a brief period of hypertension requiring treatment with Nifedipine. She was discharged home at Day 5. Post mortem confirmed severe fetal hydrops with pulmonary hypoplasia (as a result of significant pleural effusions), placental oedema and a diagnosis of Noonan’s syndrome.

Discussion

Mirror syndrome is likely to be underdiagnosed due to its low incidence and a lack of awareness of its diverse clinical features. It is often termed triple oedema; with fetal, placental and maternal oedema present¹. Studies have suggested the incidence to be 0.024%, and as high as 37.8% where fetal hydrops is present. It is associated with significant maternal morbidity with clinical features including anaemia, peripheral oedema, pulmonary oedema and cardiac failure. Risk of fetal mortality is high (67.26%)².

A raised nuchal thickness preceded a diagnosis of cystic hygroma in this case; a condition caused by an obstruction between the jugular lymphatic and venous systems. Karyotype and microarray were normal on amniocentesis however post mortem genetic studies demonstrated Noonan’s syndrome, known to go undetected on antenatal microarray. Cystic hygromas are associated with chromosomal disorders, most commonly Turner’s in 50% of cases and a genetic syndrome in 40% of cases, most commonly Noonan’s Syndrome. Progression to hydrops is found in 60-80% of cases of cystic hygroma.³

Progressive maternal symptoms in the context of fetal hydrops requires careful differentiation from more commonly seen pre-eclampsia. The pathogenesis of mirror syndrome is poorly understood but is hypothesised to comprise maternal vascular endothelial dysfunction, hence the clinical overlap. The presence of fetal hydrops, polyhydramnios (as opposed to growth restriction with oligohydramnios), normotension, pulmonary oedema whilst fluid restricted and an absence of hyperreflexia and proteinuria supported mirror syndrome as a diagnosis. Mild renal and liver derangement and thrombocytopenia are seen in both conditions, however mirror syndrome is a hypervolemic state unlike the haemoconcentration seen in pre-eclampsia, hence a low haematocrit supported the diagnosis.⁴

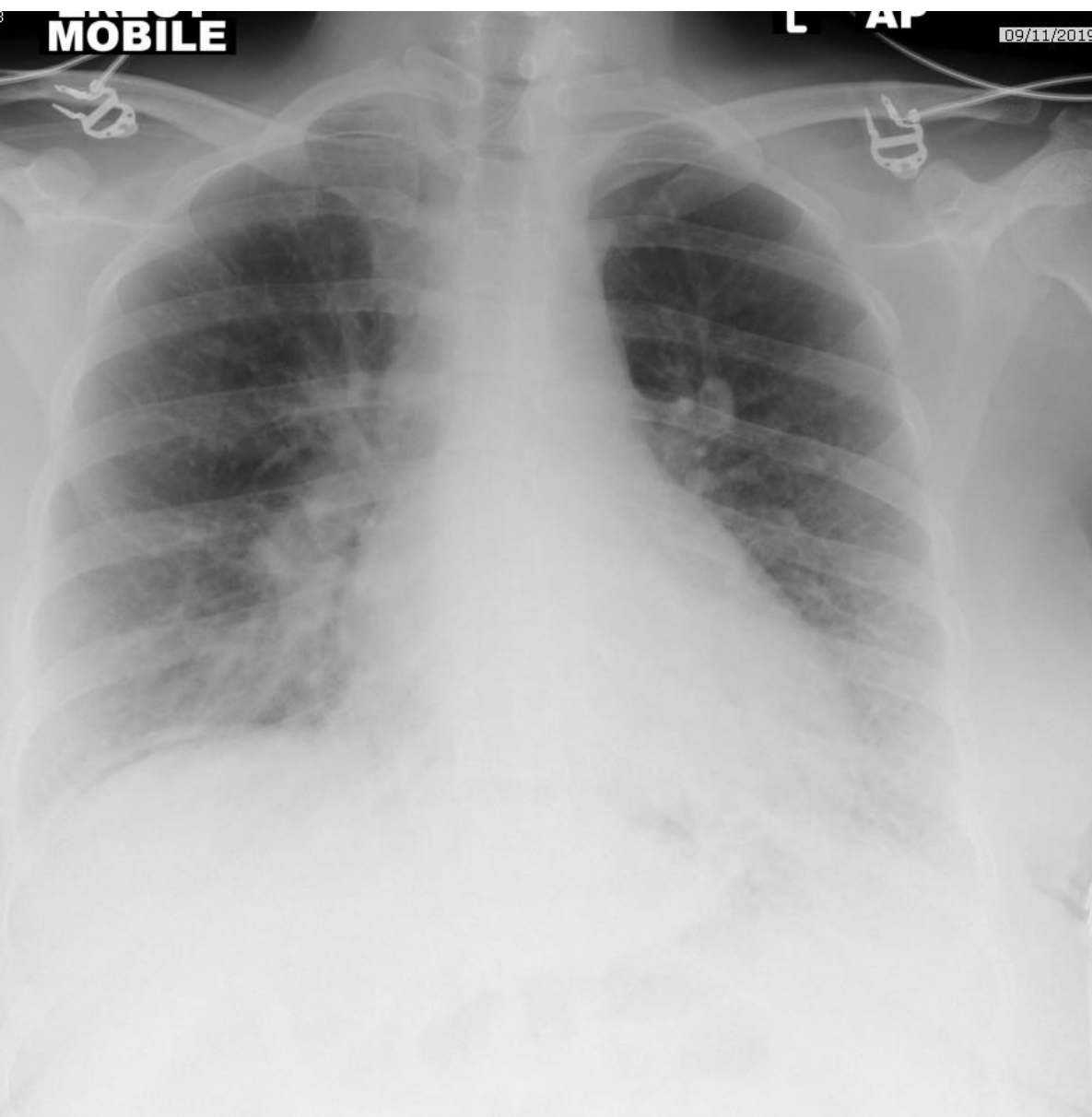
Due to non-immune hydrops being present, in-utero fetal therapies had no role in this case, instead delivery or a continuance of the pregnancy with supportive management for maternal symptoms were the only potential strategies. Delivery was undertaken in the knowledge of a significant risk of neonatal loss.

Maternal Investigations

Table 1: Maternal Biochemistry

	27+2	27+3	Day 2 Postnatal
WCC 10 ⁹ /L	11.4	9.5	12.8
Hb g/L	91	82	90
Hct	0.221	0.219	0.289
Plts 10 ⁹ /L	102	90	100
ALT U/L	63	77	34
Urea mmol/L	6.6	7.1	4.0
Creat umol/L	92	98	67
K mmol/L	3.4	3.5	4.2
Lactate Dehydrog enase U/L	362	-	-
UPCR mg/mmol	24	26	-

Figure 5: Maternal Chest Radiograph 27+2



Conclusion

Mirror syndrome must remain a differential diagnosis where a case of ‘atypical pre-eclampsia’ is being managed in association with significant fetal pathology to allow full clinical assessment to be undertaken and to minimise maternal and fetal morbidity and mortality.

References

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