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Massive Materno-Fetal Transfusion: an unusual case of neonatal polycythemia

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CASE HISTORY

Mrs. W, a gravida 5, aged thirty-three, was delivered at Southmead Hospital, Bristol, in March, 1969. Pregnancy was uncomplicated. A normal vertex delivery took place at thirty-nine weeks gestation. The baby was a normally formed girl weighing 7lb 15oz with a length of 50cm and a head circumference of 35cm. The placenta weighed 2lb 3oz and appeared normal. The umbilical cord was clamped and divided at 30 seconds after delivery. Mrs. W's blood group was Group A, Rh positive.

Baby N did not require resuscitation but was noted to be intensely plethoric and bloated at birth (Figs 1(a) & (b)). She had moderate respiratory distress with grunting expiration and coarse rales in all lung fields. Haematological investigation revealed her to be Group A, Rh positive with a venous haemoglobin of 25.8g % and a haematocrit of 75%. By the age of twelve hours, baby N was showing signs of cyanosis. A dilution exchange transfusion with plasma via the umbilical vein was undertaken. At once her plethora and signs of respiratory distress resolved. She required no further treatment. Following the exchange transfusion her haemoglobin had fallen to 14.6g %. Using differential agglutination tests, it was possible to demonstrate that baby N's blood prior to exchange transfusion had contained a large volume of maternal erythrocytes amounting to approximately one third of her circulating blood volume. Baby N's progress was uneventful and when last seen at the age of fourteen months her physical and developmental progress was regarded as normal (Fig 3).

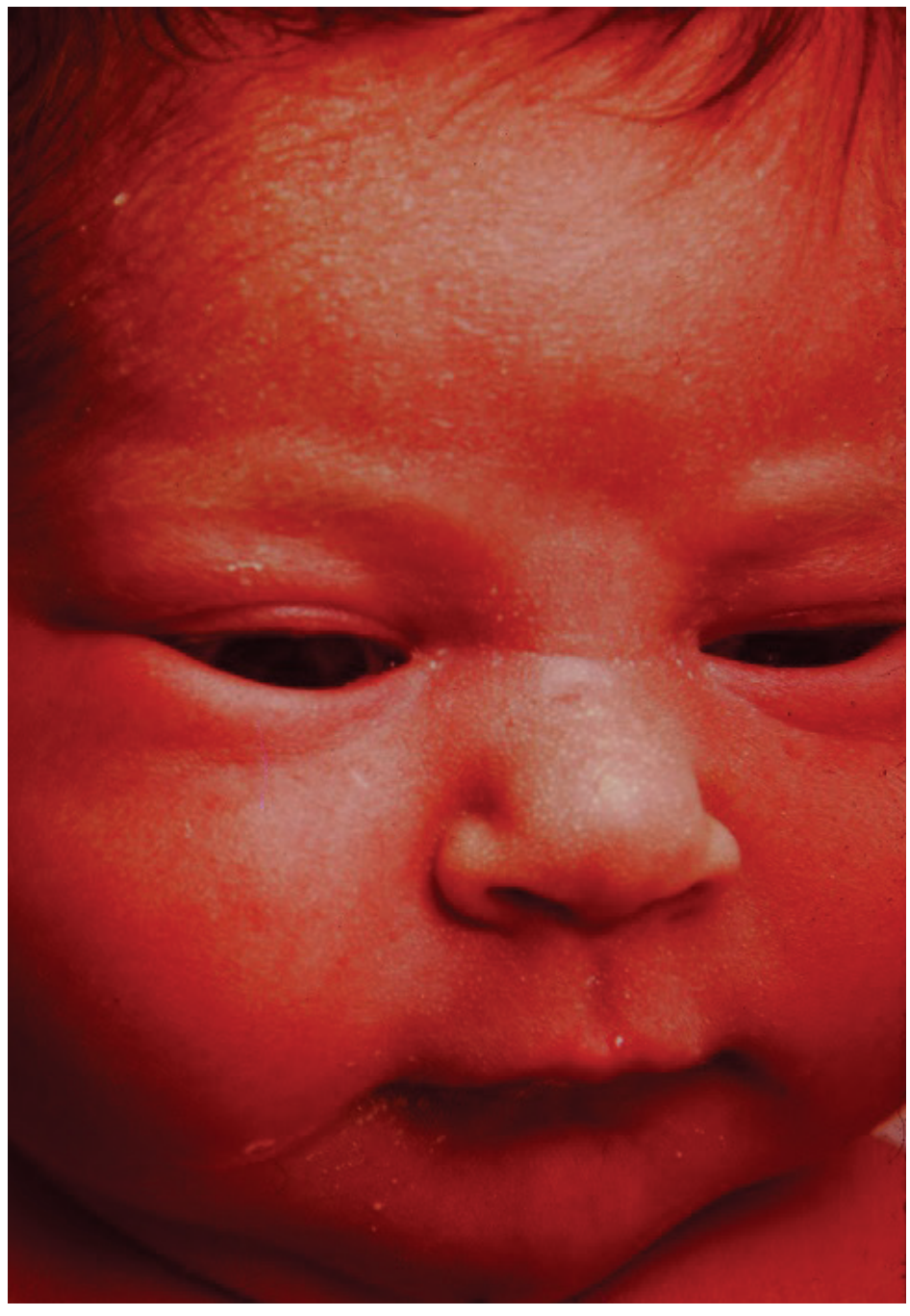

Fig 1 (a) Baby N soon after birth (with parental permission)

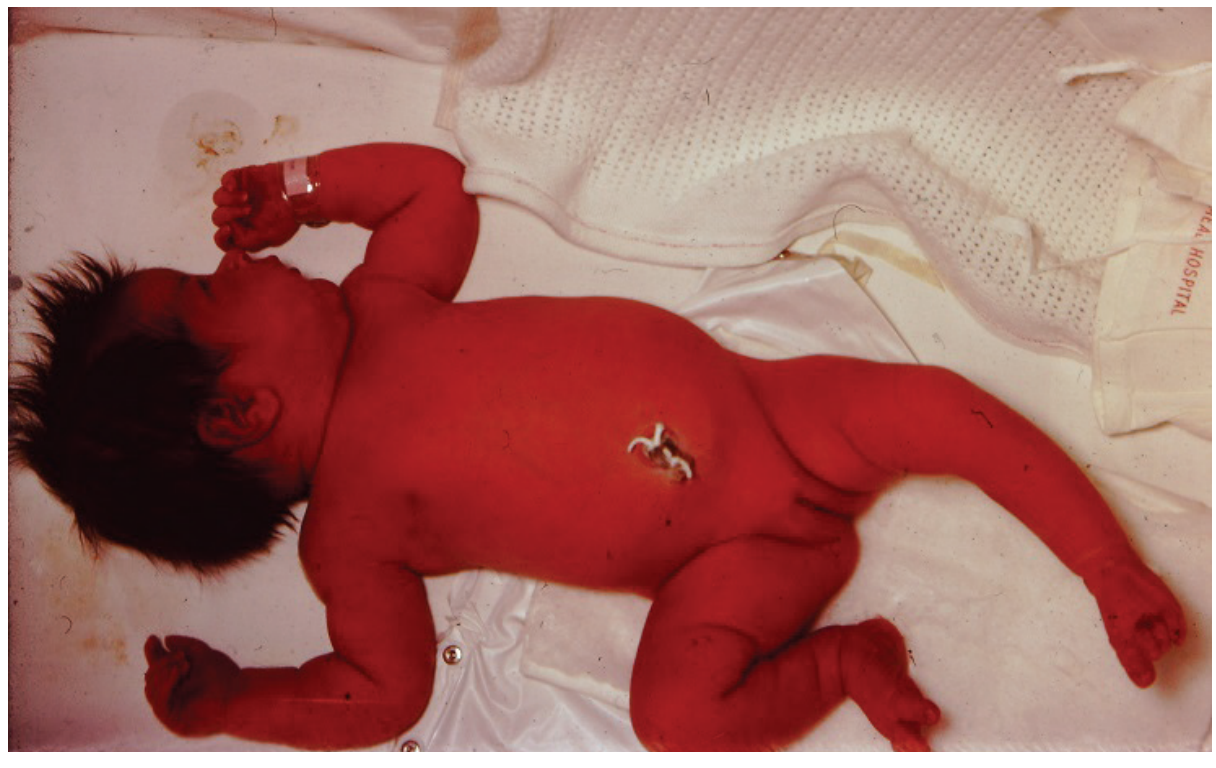

Fig 1(b) Baby N demonstrating intense plethora soon after birth

COMMENTARY

Neonatal polycythemia is commonly due to a large placental transfusion following delayed clamping of the umbilical cord [1,2]. In the present case this cause was

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Fig 3 Baby N, aged 14 months

improbable in view of the fact that the cord had been clamped at thirty seconds of delivery. Neonatal polycythemia may also be encountered following chronic fetal hypoxia. However, baby N was not only well grown but had no history of fetal distress and had not required resuscitation. As a result a search was made for the possibility of materno-fetal transfusion. This was complicated by the fact that both mother and baby's major blood groups were identical, Group A, Rh positive. The late Dr. Geoffrey Tovey (Fig 4), Director of the National Blood Transfusion Service based at Southmead Hospital took a special interest in this case and undertook the differential agglutination tests.

Fig 4 The late Dr. Geoffrey Tovey, CBE
Director of the National Blood Transfusion Service

While microscopic leaks of erythrocytes between maternal and fetal circulations were well recognised at birth and as a cause of sensitization to the Rhesus factor[3], massive materno-fetal transfusion was a condition that I had not recognised during a decade working in maternity hospitals in spite of a particular interest in neonatal polycythemia. As a result I presented this case to a clinical meeting of senior paediatricians in October, 1969[2]. None had previously encountered such a case. However, a subsequent search of the literature revealed that the condition had been described first in 1961 by Michael and Mauer[4]. A year later Andrews and Thompson[5] had reported a further two cases and suggested that materno-fetal transfusion might indeed not be a rare phenomenon. Be that as it may, massive materno-fetal transfusion still remains very unreported as a cause of neonatal polycythemia.

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