



## Hyperimmune Plasma Therapy in Equine Neonates with Inadequate Passive Immunity: A Case Series

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**Abstract:** Failure of passive transfer (FPT) in neonatal foals constitutes a frequent and clinically significant emergency, predisposing affected individuals to an increased risk of systemic infections and mortality. This case series presents the clinical management of five neonatal foals diagnosed with FPT and treated with locally sourced hyperimmune plasma at the Veterinary Teaching Hospital of the University of Life Sciences "King Michael I" of Timisoara (ULST), between 2024 and 2025. Serum IgG concentrations, assessed using a commercial rapid test, were below the protective threshold in all cases. All foals received hyperimmune plasma, either enterally or intravenously, depending on age and clinical status. Three foals exhibited signs of neonatal septic shock and therefore required intensive supportive care. Follow-up IgG testing confirmed adequate passive transfer in four foals after a single administration, while one required a second dose. All cases evolved favorably from a clinical standpoint, with follow-up conducted up to six months of age. This report highlights the importance of early diagnosis and intervention in FPT, the therapeutic value of plasma transfusion, and the role of individualized care strategies. The findings support the feasibility and efficacy of this approach in equine neonatal practice, particularly in academic veterinary hospital settings.

Keywords: equine neonatology, passive immunity, immunoglobulin therapy, septic shock, plasma transfusion

### • Introduction

In foals, the transfer of maternal immunoglobulins, especially IgG, via colostrum within the first 6–12 hours of life is essential, as the equine placenta blocks in utero antibody transfer.

Failure of passive transfer (FPT), defined by IgG levels <400 mg/dL at 12–24 hours, increases susceptibility to infections such as sepsis and pneumonia.

Diagnosis relies on rapid tests, and treatment typically involves hyperimmune plasma administration.

When commercial plasma is unavailable, plasma from healthy local donors can serve as an effective alternative. This study presents five FPT cases treated using locally sourced plasma.

### • Material and method

This study (2024–2025) included five neonatal foals (3 colts, 2 fillies) evaluated at the Veterinary Teaching Hospital, USVT. Foals aged 6–50 hours underwent clinical and paraclinical exams, including IgG rapid test, CBC, and serum biochemistry.

FPT (IgG <400 mg/dL) was confirmed in all cases.

Locally harvested hyperimmune plasma from screened institutional geldings was used for treatment. Plasma was obtained via jugular catheterization, separated by gravity, and administered at 20–25 mL/kg (fig 1, fig 2). One foal received oral plasma (age <8 h); the others were treated intravenously (fig 3). In one case, the Madigan Squeeze Technique was applied for suspected neonatal maladjustment syndrome (fig 4).

Follow-up IgG testing was performed 24 h post-treatment. Additional plasma was given if needed. All foals received supportive care; four were hospitalized, and one treated in the field. Follow-up extended to 6 months via owner reports.

### • Results and discussions

All five foals were diagnosed with FPT (IgG <400 mg/dL). Three foals showed clinical and laboratory signs of neonatal sepsis, including leukopenia/neutrophilia with left shift, thrombocytopenia, hypoglycemia, hypoalbuminemia, acidosis, and azotemia. These foals were critically ill at presentation.

Two foals had FPT without systemic inflammation—one of which (Foal 1) received adjunctive Madigan squeeze therapy for mild neurological signs.

Hyperimmune plasma (20–25 mL/kg) was administered to all foals, nasogastrically in one and, IV in four.

No adverse reactions occurred.

Four foals reached IgG >800 mg/dL after one transfusion. One foal (treated at 50 h) required a second dose due to poor initial response.

All foals survived and recovered fully, with no complications reported at 6-month follow-up. Despite the small sample size, results support the efficacy of early FPT detection and treatment using locally sourced plasma. The study highlights the importance of rapid IgG testing, aggressive supportive care, and tailored interventions—even in septic or neurologically depressed foals.

### • Conclusions

FPT in foals is a critical emergency requiring early detection and rapid intervention. This case series confirms the effectiveness of a structured protocol including semiquantitative IgG screening, bloodwork, and timely hyperimmune plasma administration—either in-hospital or in the field.

All five foals recovered fully, demonstrating the value of individualized care.

Rechecking IgG levels post-transfusion, especially in late-treated foals, is crucial.

The Madigan squeeze technique was a safe adjunct in one neurologically affected case.

### Key clinical takeaways:

- IgG testing within 12–24 h of life
- Age- and condition-adapted plasma therapy
- Early detection of sepsis through lab profiling
- Field-applicable tools for practical and flexible management

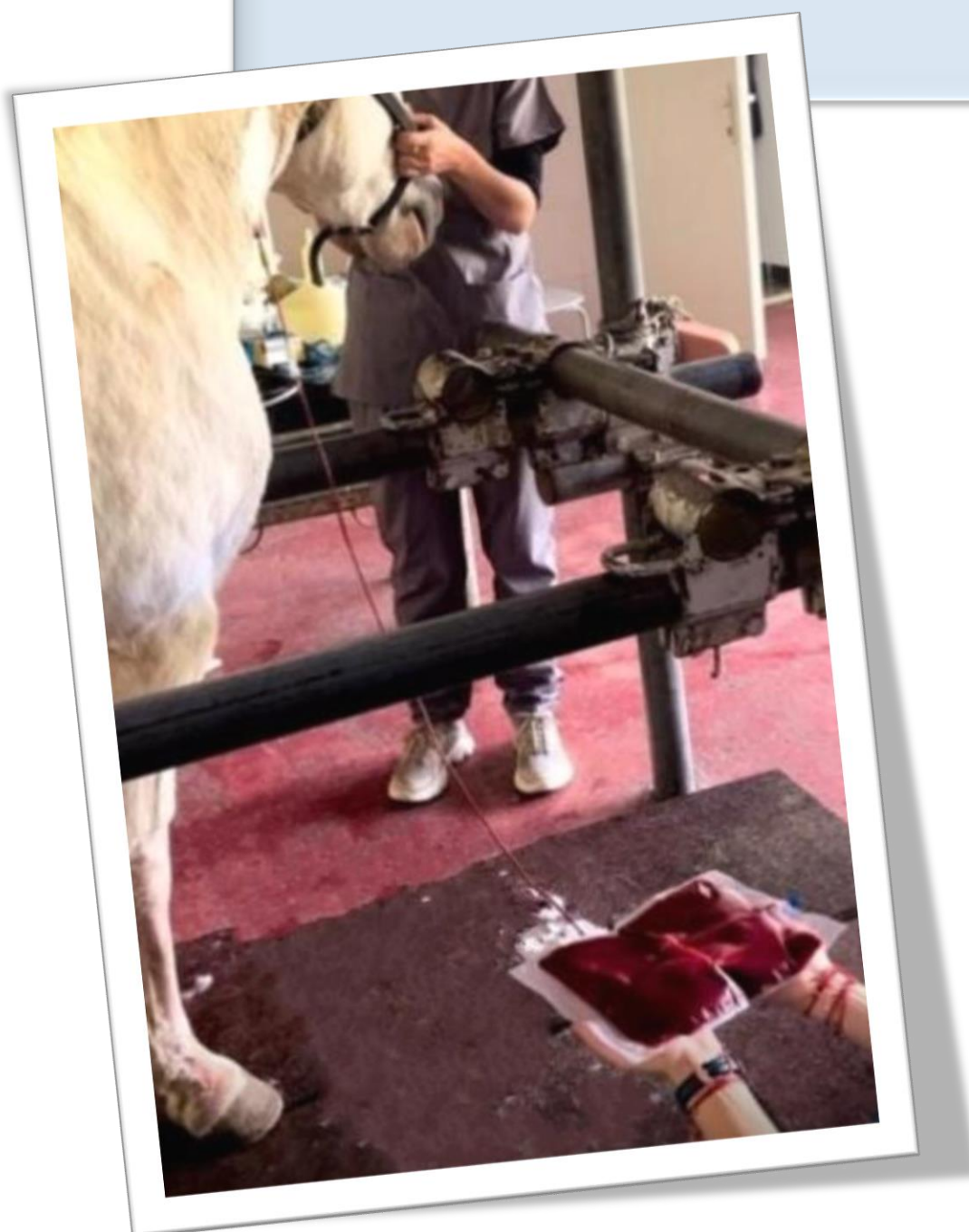


Figure 1. Blood collection from a horse via jugular vein catheterization. The image illustrates the aseptic placement of the catheter and the controlled collection of whole blood into a sterile blood bag.



Figure 2. Passive separation of plasma by gravity. The image shows the sedimentation of blood components in the collection bag, with plasma being transferred into a secondary sterile bag after separation.

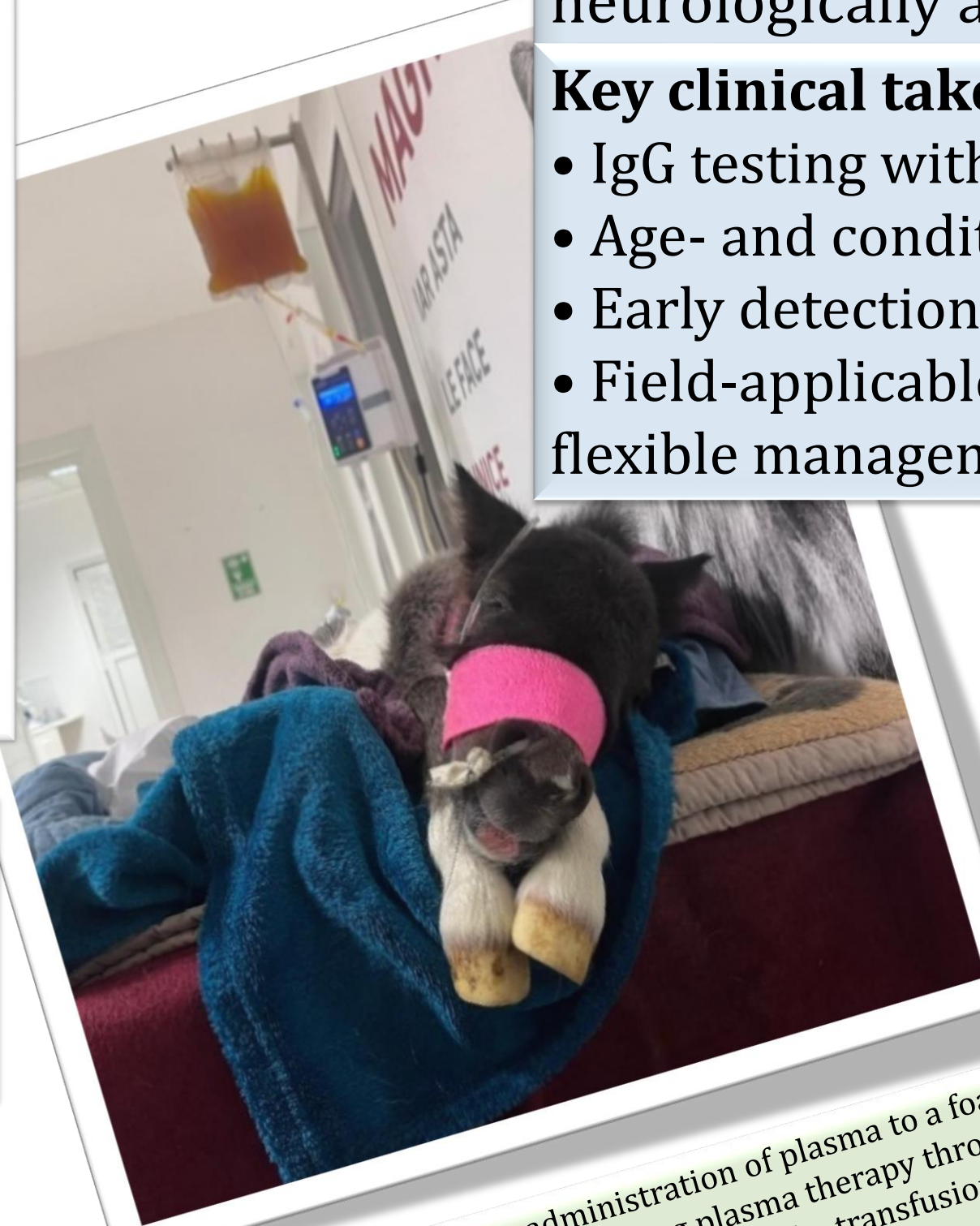


Figure 3. Intravenous administration of plasma to a foal. The image depicts a foal receiving plasma therapy through an intravenous catheter, illustrating the transfusion procedure used in neonatal equine care.



Figure 4. Application of the Madigan Squeeze Technique in a foal with suspected neonatal maladjustment syndrome. The image shows the controlled restraint of the foal using ropes, simulating the pressure experienced in the birth canal to help reset neurosteroid levels and improve neurologic function.