

11 hour-old colt

History of dystocia

- ❖ Labor approximately two hours
- ❖ Veterinarian arrived
- ❖ Correct the dystocia quickly

Born at 11:00 a.m.

- ❖ Weak and unable to stand
- ❖ Fed colostrum
- ❖ Treated with DMSO
- ❖ Referred

Arrived in the front of a stock trailer

- ❖ Very wet, cold, minimally responsive

Case 1

Physical examination

- ❖ Temperature 95.6 F
- ❖ Ice cold legs, no peripheral pulses
- ❖ Severe entropion with sunken eyes
- ❖ Mucous membranes
 - Pale and muddy
 - Splotchy areas of hyperemia
- ❖ No oral, aural, or scleral hemorrhages
- ❖ Blood pressure low
 - Could not obtain ABG
 - Could not measure BP

Case 1

Admission blood work

WBC	671	Na	132.4
Segs	20%	K	3.83
Bands	0%	Cl	96
Lymphs	80%	Cr	3.97
Fibrinogen	224	Glucose	41
PCV	38%	IgG	< 200
T.P.	5.8		

Case1

You decide the foal is in septic shock

Name 3 findings from PE that support the diagnosis of shock:

Name 2 laboratory findings that support the diagnosis of sepsis:

Name 3 things you would do to treat the shock:

Case 1

After your initial treatment

- ❖ His legs began to warm

Now you would like to treat the suspected septic origin of the shock.

Name 2 ways you could do this.

Case 1

You decide to treat the hypoglycemia

- ❖ By placing the foal on a 10% dextrose solution
- ❖ The foal weighs 111 lbs on admission

What is a reasonable initial fluid rate

- ❖ which would deliver enough dextrose to equal what is usual produced by the neonatal liver?

Would this result in enough fluids to meet maintenance fluid need for this foal?

Case 1

111 lbs = 50 kg

4 – 8 mg/kg/min

❖ $4 \text{ mg} \times 50 \text{ kg} = 200 \text{ mg/min}$

❖ $200 \text{ mg/min} \times 60 \text{ min} = 12000 \text{ mg/hr}$

❖ 10% dextrose = 100 mg/ml

❖ $12000 \text{ mg/hr} / 100 \text{ mg/ml} = 120 \text{ ml/hr}$

Case 1

111 lbs = 50 kg

- ❖ 10 kg - 100 ml/kg/day = 1000 ml
- ❖ 10 kg - 50 ml/kg/day = 500 ml
- ❖ 30 kg - 25 ml/kg/day = 750 ml
- ❖ Total/Day = 2250 ml
- ❖ 94 ml/hr

Case 1

His initial ABG:

❖ On INO_2 4 lpm

PH	7.188
Paco ₂	57.2 torr
Pao ₂	73.2 torr
HCO ₃	22.5
BE	- 6.1
O ₂ Saturation	92.2%
O ₂ Content	14.7

Case 1

By 1:30 a.m. the foal's lungs began to sound moist and his arterial blood gas had deteriorated.

Case 1

pH = 7.253

Pco2 = 68

Po2 = 38

SAT = 47

Cont = 8.0

HCO3 = 30

BE = 2.2

INO2 = 10 lpm

Case 1

The foal was placed on a ventilator
with an $F_{iO_2} = 1.0$.

Case 1

pH = 7.196

Pco₂ = 63

Po₂ = 75

SAT = 87

Cont = 10.8

HCO₃ = 25

BE = - 3

Case 1

The foal was placed on NO at
26 ppm in the inhaled gas.

Case 1

The foal became hypotensive

- ❖ S43/D22 M26 and HR = 80 bpm
- ❖ Urine production < 10% of that expected

His hypotension was treated with IV methylene blue

- ❖ Block local NO production
- ❖ NO produces hypotension in septic shock

Resulted in a transient but dramatic increase in blood pressure

- ❖ S126/D61 M74 and HR = 94
- ❖ Despite this, the foal became anuric. Why?

Case 1

BP began to fall again within 2 hours

Developed pulmonary edema

- ❖ Fluid began to appear in the endotracheal tube

Difficult to measure BP

Developed progressive abdominal distention

Despite our intensive efforts

- ❖ Not responding to therapy
- ❖ Euthanized

Case 2

17 hour old filly

Born at 4:00 a.m.

- ❖ 345 days gestation
- ❖ Placenta was normal
- ❖ Delivery was fast

The foal never suckled the mare

Contracted left hind fetlock

Case 2

By 8:00 a.m.

- ❖ Not nursing
- ❖ Able to stand in front but not behind
- ❖ Began to suckle from a bottle but never vigorously

During the day

- ❖ Foal became weaker
- ❖ Required tube feeding

Case 2

Arrived down in the van but quite active

Oral mm were splotchy, muddy

You decide to place the foal on INO_2

- ❖ Before completing your PE

- ❖ Because of the mucous membranes

What flow rate of O_2 would you begin on?

Case 2

After beginning the INO₂

- ❖ Oral mm turn pink with large vessel injection

There are no oral, scleral or aural petechia

Labored breathing

- ❖ Respiratory rate 48
- ❖ Only mild nostril flare
- ❖ No abnormal lung sounds

Good borborygmi

Umbilicus is normal

Case 2

Temperature of 100.4° F, HR of 78 bpm

Weighed 111 lbs.

Thin

Normal hair coat

Good ear cartilage development

No excessive joint laxity

❖ Left hind fetlock moderately contracted

Case 2

Good peripheral pulses

Feet and ears are warm

BP 80/43 (51)

Periods alert and aware

Periods of deep sleep

Stands with little assistance

- ❖ < 5 min. supporting herself well
- ❖ Knuckles on left hind fetlock

Case 2

Initial laboratory analysis:

WBC	1,440	Na	136.7 meq/l
Segs	55%	K	3.35 meq/l
Bands	3%	Cl	97 meq/l
Lymphs	41%	Cr	1.34 mg/dl
Monos	1%	Glucose	138 mg/dl
Fibrinogen	341	IgG	400 mg/dl

Case 2

- What does the WBC and fibrinogen tell you?
- How can you tell this problem began *in utero*?
- What does the IgG level tell you?
- Name 2 ways you could try to correct the problem indicated by the IgG level?
- How can you tell if the treatment you chose worked?

Case 2

The next morning

Foal's attitude improved

Appeared to be doing well

You have been giving her intravenous dextrose overnight

- ❖ Now you want to begin enteral feeding
- ❖ No meaningful suckle

How can you feed her enterally?

Case 2

Begin with 10% body weight

How much should you feed the foal every
2 hours to reach this goal?

How many kcals/kg will this provide?

Name 2 ways you could treat the hind leg
fetlock contracture.

Case 2

First few days of hospital stay

- ❖ Improved attitude and strength
- ❖ Periods of normal activity
- ❖ Very responsive to surroundings
- ❖ No suckle
- ❖ Very active search
- ❖ Only a licking motion with her tongue
- ❖ Never meaningfully suckled

Case 2

Hospital day 4

WBC

- ❖ Increased to normal range
- ❖ On day 4 decreased to 2,340/ μ l

Fibrinogen slowly increased

- ❖ Peak of 479 mg/dl

Fed 20% of her body weight

How many kcal/kg/day is she being fed?

Healthy foals usually gain weight at this level of nutrition. But, there was no weight gain on this level of nutrition. Why not?

Case 2

Hospital day 6

Gained weight

Contracture was improving

She still had no meaningful suckle response

- ❖ She used her tongue quite well

Case 2

Hospital day 8

Filly nursed off the mare several times

Appeared to be suckling getting some milk

Next day

- ❖ She only lick and could not nurse effectively

Case 2

Hospital day 13 - 22

By hospital Day 13

- ❖ She had perfected the art of sucking on her own tongue
- ❖ She had no tongue curl
- ❖ Not suckle objects
- ❖ Suckle with tongue out the side of mouth
- ❖ Could not coordinate sucking activity

Hospital Day 18

- ❖ Finally began to nurse off the mare

Discharged on Hospital Day 22

Case 2

Many of this foal's signs

- ❖ Can be explained by NE and sepsis

Name 2 signs consistent with NE

Name 3 signs consistent with sepsis