

Case Report (1) for VBMA Certification

Idiopathic Heptobiliary Disease in an Equine treated with Chinese Herbal Medicine

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Abstract:

A fourteen year old Arab was diagnosed with idiopathic heptobiliary disease. His owner, wanting the best fastest cure, incorporated alternative modalities, acupuncture and Chinese Herbal Medicine in his therapy. His was diagnosed with a deep underlying Spleen qi deficiency but with a current life-threatening Triple Heater obstruction caused by a Liver fire from Liver stagnation. His response was dramatic. Within two weeks, he was acting clinically normal, although the depth of his disease was evident with TCM diagnostic techniques; tongue and pulse. This very deep pattern of disharmony took six months to resolve.

Introduction:

Liver disease frequently occurs in horses and its incidence is increasing. (Divers, 1992) Our equine athletes are exposed to innumerable toxins during their training and show competitions. This increased load on the liver is reflected in the amount of hepatic disease seen today. The prognosis is related to the amount of toxic exposure. (Smith, 2003) There are over 900 drugs that have been implicated in causing liver damage. Chemicals often cause subclinical injury to the liver and in the human literature; chemicals are responsible for over 50% of all acute liver failures. (McNally, Peter, 2006). The body identifies almost all drugs as foreign substances and subjects them to various chemical processes to make them suitable for elimination. This involves chemical transformations to firstly reduce fat solubility and to secondly change the biological activity. The smooth endoplasmic reticulum in the liver is the principal “metabolic clearing house”. A group of enzymes located in the endoplasmic reticulum know as cytochrome P-450, is the most important family of metabolizing enzymes. Several mechanisms are responsible for either inducing hepatic injury or worsening the damage process. Many chemicals are also responsible for damage to the mitochondria. The dysfunction of the mitochondria causes a release of excessive amount of oxidants which can then injure hepatic cells. Activation of some enzymes in the cytochrome P-450 system such as CYP2E1 also can lead to oxidative stress. Injury to these hepatocytes and bile duct cells then lead to accumulation of bile acids which will further promote liver damage. (Wikipedia, 2011) Interestingly iron supplements have been frequently blamed as a toxic cause of liver failure. (Pearson, 2001) Biliary Obstruction secondary to gastrointestinal disease may sporadically cause Hepatic failure. Hepatic disease has been seen concurrently with displacements of the large colon. (Divers, 1992), papillary structures caused by duodenal ulcer, (Buote, 2003), and neoplasia. Obstructions can also be caused by Portal vein thrombosis.

Other causes of Liver Disease include infectious causes such as Tyzzer's Disease; and Metabolic causes such as hepatic lipidosis and hyperammoninemia from gastrointestinal disease. (Divers, 2005)

Chili, our case study, had suffered from stiff achy muscles which started concurrently when a daily wormer was added to his supplements. He also suffered from large colon torsion three months prior to the onset of his liver disease. His blood work had no indication of an infectious or parasitic cause. He also had no known exposure to any toxic substance but he had been shown and trained in an environment where pesticides; vaccines, and chemical preservatives for grain and hay were heavily used. It could be possible for the synergistic effect of all of these substances to predispose him to the hepatic destruction that was found with the addition of the traumatic insult to his bile duct during the colon torsion.

Traditional Chinese Medicine can look past these individual pieces of the puzzle to look at the whole picture and delve into an even deeper cause for all of his disease manifestations: an obstruction of his Triple Heater Meridian.

Case Report Presentation:

Signalment

Chili is a fourteen year old gelded Arabian Equine. He is a nationally rated show horse who had a very intensive training and showing career.

TCVM Diagnosis

Triple Heater Obstruction from Liver Fire (3/5/11) with a Damp-Heat pathogenic factor trapped in the Shao Yang layer.

Conventional Medical Diagnosis:

Idiopathic Heptobiliary Disease (3/1/11)

History

Chili had an intensive life. He was (and will be again) a nationally rated show horse. When in training, it is very intensive both in terms of physical and emotional stress. His show schedule was full and demanding. Like most equine athletes, he was exposed to many toxins, pesticides, and multitudes of vaccines. In May of 2010, he received Tetanus, Eastern and Western Encephalitis, Influenza, Rhinopneumonitis, West Nile Virus, and Rabies immunizations. He was on Daily Strongid. I occasionally would see him during his show season for chiropractic work when he was home from the trainers. 7/30/10-Chili had a significantly restricted motion in the lower Lumbar vertebrae and cervical vertebrae 3 and 4 to the right which was chiropractically adjusted; his had Temporal-mandibular joint (TMJ) pain and pain over his hips which were treated with cranio-sacral techniques. His tongue was purple. His pulse was wiry and fast. He had severe blood stagnation; that is, his was sore everywhere. His owner mentioned that the trainer used a daily chemical wormer. She strongly associated the appearance of his stiffness with the use of the daily wormer. We talked about the possibility of Leaky Gut disease with his liver being overloaded. The owner was going to try to change the wormers used at the trainer but...her trainer did not believe in "that stuff"; Chili was started on Body Sore. Body Sore is a formula made by Jing Tang which is based on Shen

Tong Zhu Yu Tang (Xie, 2004) this formula is indicated when there is a fast pulse and purple tongue caused by channel blockage (Subluxations) with qi and /or blood stagnation. The formula uses Ligusticum, Chuan Xiong and Notopterygium, Qiang Huo, to relieve pain and activate Blood; assisted by Angelica, Dang Gui; Epimedium, Yin Yang Huo; Eucommia, Du Zhong; and Psoralea, Bu Gu Zhi, help to strengthen yang and bone; Achyranthes, Niu Xi helps to strengthen the bones and limbs; Angelica, Du Huo and Clematis, Wei Ling Xian relieve pain and eliminate Wind-Damp; Cuscuta, Tu Su Zi, nourishes Liver and Kidney; Corydalis, Yan Hu Suo is a strong pain reliever and resolves stagnation and moves Qi and Blood; Persica, Tao Ren, and Carthamus, Hong Hua breaks down Blood Stasis and relieves pain; Millettia, Ji Xue Teng Nourishes Blood; Peony, Chi Shao, relieves pain and cools the blood; and Saussurea, Mu Xiang relieve pain and move Qi. He was started on 2 tablespoons twice a day.

(Hmm...as the case progresses, note that I missed a clue here, I was in a chiropractic mode and the owners concern was his soreness and muscle pain.)

11/18/10-Chili was finished for the show season. He had shown very well, his owner was very pleased how he did, but he was a wreck. He had very severe Left sided TMJ pain; his brachiocephalicus muscle was in spasm; his lumbar-sacral joint was restricted in its lateral motion; his pterygoideus internus muscle was severely painful; and his first two cervical vertebrae were tense. His tongue was purple; his pulse was choppy and fast. His parotid gland was very swollen. He had a rabies booster right at the end of show season. There had been a rabid raccoon nearby his owner's barn and she was fearful. The acupuncture points, LI 4, 11, 16, and Bl 11, 25 were very sore. At this time, his TCM diagnosis was still blood stagnation but with a Blood Toxin. I was very wondered about the swollen parotid glands. I often see that as a residual Rabies Vaccine effect.

(Lankenau, 2009) I felt the TMJ; the cervical pain; pterygoideus internus pain; and the spasms in his brachiocephalicus muscle were all inter-related with this residual heat toxin in the parotid gland. I changed Chili's formula to address this perceived toxin using a Western formula developed by David Winston called Spirolyd and mixing it with a K'an form of Shen Tong Zhu Yu Tang called Meridian Passage, 60 drops twice a day. Spirolyd Compound incorporates Sarsaparilla rhizome, Smilax, Guaiac resin, Guaiacum officinale, and Stillingia root, Stillingia sylvatica as a traditional treatment for syphilis with Andrographis to clear blood heat while Prickly ash bark, Zanthoxylum clavaherculis balances the temperature, stimulates circulation and absorption and relieves pain.(Winston, 2006) This formula has been very helpful in removing trapped pathogens. Since the weather has just turned un-seasonally warm, and all of my Lyme patients were stiff, I wanted to use a product that would also be effective against spirochetes. The owner's initial report a week later indicated that he was feeling better.

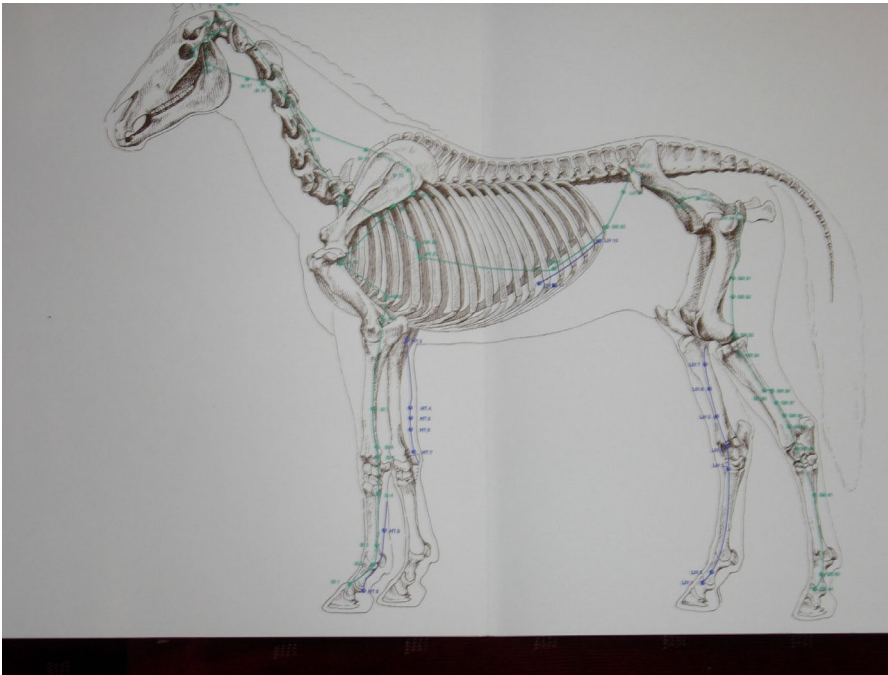
BUT...Disaster struck the next month.

12/19/11-We had a horrific blast of bitter cold. Chile was found down in his stall. His conventional veterinarian, upon rectal palpation, diagnosed large colon torsion and he was shipped immediately to Cornell's Surgical hospital. He handled surgery very well and seemed to be doing very well, Chili's owner requested no follow up as she felt he was just fine and recovering well until....

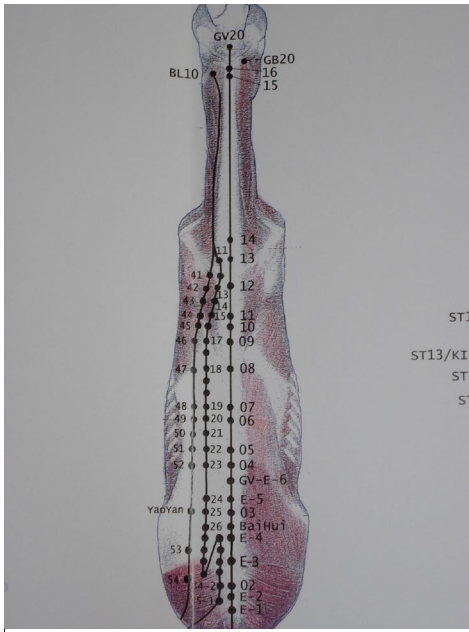
Recent History and Treatment

On 3/1/11-Chili had an acute history of inappetence and colic; his owner found him struck in the corner of the stall with his head against the wall. His conventional veterinarian found him to be markedly icteric. Blood was drawn. He was started on Trimethoprim-Sulfadiazine and Banamine. A marginal improvement was seen in appetite. But his bilirubin values, both total and indirect, were increasing. His conventional veterinarian was very pessimistic about Chili's prognosis. His owner was very concerned and wished to incorporate alternative therapies.

3/5/11- Chili was still depressed. His owner said that his appetite had slightly improved and he would at least pick at his hay since the antibiotic (Heat Clearing effect) and Banamine (Qi moving effect) was started. Antibiotics have a heat clearing effect and the Banamine has a qi moving effect.(Marsden, 2008) He was very lethargic and depressed. He would just stand in his stall as if in a daze then sort of "wake up" and then occasionally pick some of his hay. He had a incredible pain and heat all along his costochondral junction. GB 25, 29,20, 29, 34; Liver 13, 14 and Bl 18, 19, 20, 21, 22 were all reactive acupuncture points.



(Van den Bosch, 1995)-The entire Gall Bladder median was hot and very painful. Note especially GB 25, 27, 28, 28, 30, 34) Chili's pulse was fast and forceful but very tense and wiry. It was soothed when Gall Bladder points were needed.)



(Van den Bosch, 1995) Illustrated is the dorsal Bladder meridian.

His Sclera was bright yellow; Pulse fast and forceful but very tense and wiry. Edge of tongue was bright red; the rest of his tongue was very purple/red/yellow but very, very swollen. His TCM diagnosis at this time was Triple Heater Obstruction (massive GB pain) from a pathogenic obstruction caused by a Liver Fire; (red, edge of her tongue, fast pulse); from liver stagnation (wiry pulse with purple tongue) and damp from a Spleen deficiency/stagnation as evidenced of the swollen tongue. (Past bowel torsion)

Treatment- Open the Liver Canal: 60 drops twice a day, Liver Happy: four tablespoon a day and Qing Hao, 1 teaspoon twice a day. My rationale for his treatment was that I felt the Triple Heater Obstruction was the cause for the life threatening episodes. Open Liver Canal is a variation of Xiao Chai Hu Tang that is produced by Natural Path Company. (Marsden, 2006) This formula, which expels obstructive pathogens out of the Shao Yang layer, uses Chai Hu, Bupleurum to expel pathogen up and out, with Huang Qin, Scutellaria to descend Yang back down to the lower burner, with Pinellia, Ban Xie to resolve phlegm, with Red ginseng, Shi Zhu Hong Ren Shen, as a strong Spleen tonic; Ginger, Gan Jiang, and red Jujube, Hong Zao assisted and ensure a harmonized middle jiao. This formula includes Turmeric root, Yu Jin to have a stronger Qi and Blood moving effect especially in the liver. Chili really needed the strong cholagogue effect of Turmeric. I prescribed Liver Happy also. This is a Jing Tang formula (Xie, 2004) based on Xiao Yao Wan. This was used to help resolve the Liver Stagnation, with heat. Liver Happy uses as the King herb Cyperus, Xiang Fu Zi to soothe the liver and resolve stagnation; assisting are Citrus, Qing Pi, to move the qi, soothe Liver and resolve stagnation with Peony Bai Shao Yao, and Bupleurum, Chai Hu to soothe the liver; with Saussurea, Mu Xiang and Mentha, Bo He to move Qi; Moutan, Mu Dan Pi cools the Liver; while Gardenia, Zhi Zi clears heat; Angelica, Dang Gui, helps to move blood; and Licorice, Gan Cao harmonizes it all.

I was very worried about the red edge of Chili's tongue. He had not been right for a year, since he was placed on the daily wormer, from his pain in his GB meridian and the pulse

improvement with acupuncture on those points, we knew he had a pathogen trapped in the Shao Yang Layer. But with the surging forcefulness of his pulse, he also had a heat, Damp-heat pathogen in his Qi level also. With his swollen tongue, I feared that he was too deficient to use a very strong GB/Liver heat clearing formula so I added ½ teaspoon of Qing Hao, *Artemisia annua* twice a day. This herb, Qing Hao, is one of the most effective herbs against malaria. (Chen and Chen, 2004) Qing Hao is very effective for clearing Heat; Liver Heat and Yin deficient heat and cools heat in the Ying level.

The blood work that Chili's conventional veterinarian had analysis supported his TCM diagnosis. An underlying Spleen qi deficiency is seen in the low normal numbers of his red and white cells: All of his red and white cells number values were on the extreme low side of normal side. (See appendix 2) His AST was 808 u/l (175-340), TBIL- 5.9mg/dL (0.5-2.3); and GGT 124 U/L (5-24).-indicating liver stagnation and fire. That blood work was run on 3/1/11. On 3/2/11, his bilirubin had slightly increased to 6.6 and his bile acids were 84 umol/L.(0-12). Any value > 20 is considered diagnostic of hepatobiliary disease by Cornell's Diagnostic Center at the Veterinary College.

3/8/11-blood work re-tested by his conventional veterinarian. AST-down to 513 U/L; Bilirubin down to 2.1 mg/dl (0.5-2.3); GGT- 149 U/L (5-24) Banamine had been stopped on 3/7/11 as he seemed much more bright and alert and was no longer standing in the corner.

3/8/11-Chili's seemed painful after his antibiotics; he owner stopped given them.

3/14/11-AST had decreased to 391 u/L (175-340); TBIL 2.3 mg/dl (0.5-2.3); and GGT 126 U/L (2-24).

3/19/11-Appetite is normal. Mentally he is great; Chili is brighter; there is a marked whitening of his sclera but the scleral vessels seem slightly injected. He is still very painful on his GB points with more pain on Liver points especially Bl 18. Pulse is forceful rapid, surging and slippery; my assessment was more liver Damp Heat as opposed to stagnation. Our plan is to remain on Open Liver Canal and Qiang Hao but changing Liver Happy to Long Dan Xie Gan Tang. With the surging rapid pulse there evidence of more excess Damp Heat at the qi level in his Liver/ Gall Bladder. Long Dan Xie Dan Tang is one of the top formulas to clear Damp Heat from the Qi level when the GB/Liver is affected. It sedates excess fire in the Gall Bladder Meridian. (Chen, 2009)Long Dan, Gentian, sedates fire in the Liver and Gallbladder; assisted by Huang Qin, Scutellaria, and Zhi Zi, Gardenia, to sedate fire and damp-heat in all three jiaos; Ze Xie, Alisma; Mu Tong, Che Qian Zi, Plantago, dispel damp-heat through urination; Di Huang, Rehmannia, and Dang Gui, Angelica sinensis nourishes and protects the yin and blood; Chai Hu, Bupleurum, regulates Liver Qi and guides the herbs to the Liver; and Gan Cao, Licorice harmonizes the formula. Long Dan Xie Gan Tang has very strong anti-bacterial, anti-inflammatory effects; clinically shown to have great effect in hepatitis and cholecystitis. (Chen, 2009)

3/29/11-AST- 267 U/L (175-340); TBIL 2.0 mg/dL (0.5-2.3); but still elevated is GGT: 72 U/L (5-24).

4/29/11-Chile looks wonderful. Sclera are clear, no discoloration; no injected vessels. Tongue is slightly pale and swollen with a few petechial hemorrhages; Pulse is thin slightly slippery. He still has significant heat at GB 25, 30, 29, and 34; Bl 18, 19, 22 are still reactive. His Triple Heater Obstruction still is evident but less Damp heat is present. He now has is showing evidence of his underlying Spleen Qi deficiency with slight

damp, Liver blood deficiency and stagnation. Plan: we continue Open liver and Qiang Hao but stopped Long Dan Xie Gan Tang and changed to TangKuei and Peony or Dang Gui Shao Yao San, two tablespoons twice a day. Dang Gui Shao Yao San nourishes the blood to soften the Liver while strengthen the Spleen to resolve Damp. This formula uses Dang Gui, Angelica sinensis, to tonify the blood and activate the circulation, Chuan Xiong, Chuanxiong, to activate and regulate the blood circulation, Bai Shao, White Peony, to nourish the blood and consolidate yin; Bai Zhu, Atractyloides, and Fu Ling, Poria, to strength the Spleen and resolve dampness assisted by Ze Xie, Alismatis. This formula is known to have strong hemodynamic effects. I was worried about the petechial hemorrhages on his gums.

5/27/11-Chili is doing great. He is back in training. There is only a very slight amount of reactivity at GB25. But his Pulse is slightly forceful and slippery; Tongue is pink. There has been an incredible heat wave. Chili was changed back to Long Dan Xie Gan Tang but only one tablespoon a day. He was continued on Open Liver. Qiang Hao was stopped; that extra redness of his tongue was gone.

6/03/11- AST:231 U/L (175-349); TBIL 1.5mg/dL (0.5-2.30); GGT 25 U/L (5-24)

7/14/11-AST: 232 U/L (175-349); TBIL : 1.4 mg/dL (0.5-2.3) : GGT 15 U/L (5-24)- All within normal limits.

7/23/11-TH obstruction seems to be resolved. There is no reactivity at GB 25 or 34. His gums are slightly pale pink, a few petechial hemorrhages are present; Pulse is thin again. Plan returned to Dang Gui Shao Yao. We seem to be flopping back and forth from slight excessive Damp-Heat in the Liver/GB to slight Liver deficiency/ stagnation with slight Sp qi deficiency. We stopped Open Liver Canals since there was no evidence to support Triple Heater obstruction.

8/18/11: Chili's owner is very happy; Chili is back in training and doing well. But there is slight red-edge to his tongue. The stiff neck symptom is resurfacing; there is a little heat in the GB meridian as it courses over his neck. There is a slight amount of damp-Heat that is still retained in the Qi level. Plan to change to Artemisia combination. This is a Jing Tang formula of the classic Yin Chen Hao Tang. This formula also eliminates damp and clear damp heat as there is still some type of a retained pathogen in his GB. Long Dan Xie Dan Tang appears to be slightly too strong for Chili as then he is always slightly Liver/Spleen Deficient. Artemisia uses Artemisia, Yin Chen Hao to Clear Damp heat in the Liver assisted by Zhi Zi, Gardenia, to clear Damp-Heat in The TH. This formula is different from the others in that Da Huang, Rhubarb, is used to clear that residual internal heat. Coptis, Huang Lian clears Damp-Heat; Rehmannia Sheng Di Huang to clear Heat and nourish yin; Moutan, Mu Dan Pi, to cool the liver and resolve stagnation; Peony, Chi Shao Yao to Cool Blood; Poria, Fu Ling to Drain Damp, strength spleen, and the Polyporus, Zhu Ling, and Alisma, Ze Xie, to drain Damp.

Final Treatment

9/22/11-All is great, he is back in full training, no soreness, great appetite. Tongue: healthy pink except two little petechial hemorrhage. Chili's Pulse is normal; great. No reactivity found on any Gall Bladder, Liver, Spleen points. The plan is to maintain him on a few dashes of Turmeric on his grain twice a day. Turmeric is very effective to

control bleeding due to any blood stasis; it is strongly hepatoprotective. The Turmeric used is organic scalded, dried rhizome of *Curcuma longa* from Frontier Herb Company.



This is a picture of Chili in April, 2011 when he really feeling better.

10/3/11-Owner called ecstatic. His petechial hemorrhages are gone.

Discussion:

Chili had not been feeling well for a year before his acute hepatobiliary obstructive disease. Looking back at his case, he had Damp-Heat in his Gall Bladder meridian in July of 2010. The Damp Heat pathogen was probably caused by modern horse husbandry. He was being fed a diet high in carbohydrates; a stress to his Spleen and a potential cause for pathologic phlegm while on a daily chemical wormer; a source for Liver Stagnation and then secondary heat. In addition; he was had to handle an incredible load of vaccines; another source of a Heat/Blood toxins. His final Rabies vaccination after a stressful show season seemed to be that final toxin that was overwhelming him; causing him to hold this pathogen in his parotid lymph nodes. Although he seemed to be feeling better, the acute cold caused a life-threatening stagnation and colon torsion. I did not have the opportunity to examine Chili at that time but at that time there must have been either a complete Triple Heater Obstruction or his underlying Spleen deficiency had become completely stagnant. The conventional literature recognizes that large colon torsion is a cause of Hepatobiliary obstructive disease so it is possible the trauma from the torsion increased Chili's risk of hepatobiliary obstructive disease. When Chili presented in March of 2011, his Triple Heater obstruction was a significant factor in the severity of his condition.

Triple Heater Obstructions are not a commonly discussed or diagnosed syndrome in Equine Patients yet Triple Heater Obstructions are commonly recognized in Small Animal Medicine. (Marsden, 2008)

The Triple Heater facilitates the movement of Yin and Yang energy up and down the body's long axis. If this flow of energy is completely obstructed, the intermingling of Yin and Yang energy is stopped. This situation is life-threatening. If the obstruction is

complete, collapse and death will occur. If the obstruction is only partial, syndromes such as hepatitis can occur.

This typical obstruction in the Triple Heater occurs in the middle jiao and is usually some type of a damp-heat pathogen. Damp-Heat pathogens fill a show horse's life. Their diet is high in grains a source of carbohydrates and gluten; many of which are genetically modified. This carbohydrate load can exhaust the Spleen's ability to transform qi and pathogenic phlegm is produced. Heat/blood toxins are excessively abundant in the form of vaccines. The liver is often overwhelmed with drugs to metabolize; for example the daily wormer in Chili's case. All of which create a damp-heat pathogenic factor. This pathogen can then obstruct the Triple Heater meridian. This situation is becoming very common in the Equine with resultant behavioral and physical diseases seen. (Lankenau, C; 2011)

Open Liver Canal, A Natural Path formula, was crucial in the resolution of Chili's Heptobiliary Disease; his Triple Heater Obstruction, which is a modification of Xiao Chai Hu Tang with Yu Jin, Turmeric root tuber. Yu Jin has a cold and bitter taste. It is used to move the Blood from Liver stagnation clears Heat and cool the Blood to treat bleeding tendencies; clears Liver Damp Heat to treat gall obstructions. Jiang Huang is the rhizome The rhizome is known to tonify and regulate Liver Qi with a cholaretic, hepatoprotective effect, with an ability to regulate Blood and clear Heat Phlegm with a cardioprotective, anti-inflammatory, antioxidant, antiplatelet effect.(Ross, 2010) It is fascinating that Turmeric or Curcuma longa was the herb that resolved his final symptom; chronic mild petechial hemorrhages. His response would indicate that the petechial hemorrhage was due to blood heat from a slight, still present Liver stagnation. Turmeric has been widely studied. It has been found to be ant-inflammatory, including the hepatic microvasculature (Lukita-Atmadia, W, 2002), anti-arthritis, antiulcer, carminative, cholaretic, hepatoprotective (Kim, 2011), it can improve the liver's ability to detoxify (Deshpande, UR, 2003), and antiplatelet and anticoagulant effects (Prajash, P; 2011).

In future years, horses like Chili need a protocol to help protect them from the metabolic stresses they encounter. Turmeric is likely to play a large role in this protocol.

Appendix 1 table of blood work:

Date:	Bile acids (0-12)	AST 175-340 U/L	TBIL 0.5-2.3 mg/dl	GOT 2.7-24 U/L.
3/1/11		808	5.9	124
3/2/11	84			
3/8/11		513	2.1	149
3/14/11		391	2.3	126
6/3/11		231	1.5	25
7/14/11		232	1.4	15

Appendix 2: Below are copies of Chili's blood work drawn by his conventional veterinarian. The first sample is from 3/1/11

Wg and Equi AP

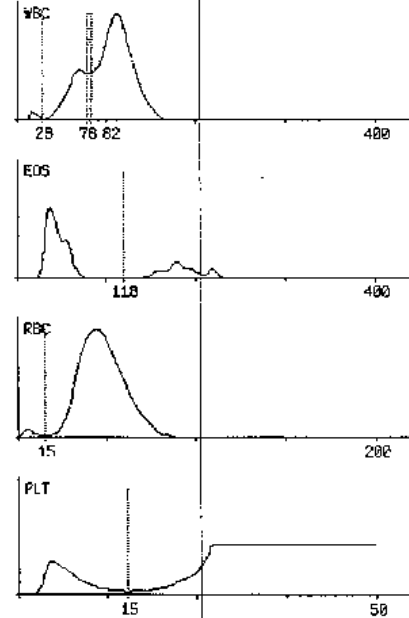
Royalton Equine Veterinary Services, PC
7735 Chestnut Ridge Rd.
Lockport, NY 14094
(716)525-8384



SmpID 54 Mode Horse
PatID 9137872 Doctor Best
Name Galecki, CHUJ Age/Sex 14 years / Neutered

Test date 03.01.2011 06:44 PM S/N 252017
Report date 03.01.2011 06:54 PM

WBC	6.68	10 ⁹ /L	5.4	14.3
LYM	1.45	10 ⁹ /L	1.5	7.7
MON	0.33	10 ⁹ /L	0	1.5
NEU	4.85	10 ⁹ /L	2.3	9.5
EOS	0.05	10 ⁹ /L	0	1
BPS	0.01	10 ⁹ /L	0	0.3
LY%	21.6	%	17	68
MO%	4.9	%	0	14
NE%	72.6	%	22	80
EO%	0.7	%	0	18
BP%	0.1	%	0	2
REC	7.62	10 ¹² /L	6.8	12.9
HGB	12.8	g/dL	11	19
HCT	36.62	%	32	53
MCV	48	fL	37	58
MCH	16.8	pg	12.3	19.7
MCHC	35.0	g/dL	31	39
RDWc	22.3	%		
PLT	126	10 ⁹ /L	100	400
PCT	0.99	%		
MPV	5.9	fL		
PDW	33.8	%		



VetScan VS2

Equine Profile Plus Patient ID: 9137872
01 Mar 2011 06:45 PM Rotor Lot Number: 0374864
Sample Type: Horse Serial Number: 000006700

MA+	130	nmol/L	126	146	
K+	3.0	mmol/L	2.5	5.2	
LDH	31	nmol/L	20	33	
CK	195	U/L	120	478	
GLU	93	mg/dL	65	118	
CA	12.6	mg/dL	11.5	14.2	
BUN	4.6	mg/dL	?	25	
CRE	1.1	mg/dL	0.6	2.2	
AST	328	U/L	175	340	
TEIL	5.9	mg/dL	0.5	2.3	
GGT	124	U/L	5	24	
ALB	3.2	g/dL	2.2	3.7	
TP	7.3	g/dL	5.7	8	
ALOE	4.1	g/dL	2.7	5	
OC	OK				
HEM	0	LIP	1+	ICT	2+



Cornell University
Animal Health Diagnostic Center

240 Farmer Road, Cornell University, Ithaca, NY 14853
Ph: 607-253-3900 Fax: 607-253-3943
http://diagcenter.vet.cornell.edu

Owner: Donna Bialoki

Royalton Equine Veterinary Service - (11640)
Dr Jaanna Best
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Lockport, NY 14094
(716) 629-8384

Finalized Report

Accession Number: 20788-11

Sampled: 03/02/2011
Received: 03/03/2011
Finalized: 03/03/2011

CLINICAL PATHOLOGY

607-253-3255

CHEMISTRY

1	CHILI - Equine Arabian Female Test Name	Result	Reference Interval	Units
	Serum			
	Total Bilirubin	5.6 (H)	0.5 - 2.5	mg/dL
	Direct Bilirubin	0.3	0.1 - 0.3	mg/dL
	Indirect Bilirubin	6.3 (H)	0.3 - 2.3	mg/dL
	Lipemia	8	Not established	
	Hemolysis	3	Not established	
	Icterus	10	Not established	
	Comment: Lipemia is an approximate measure of the degree of turbidity in the sample as follows: <30 = no turbidity, 30-60 = slight turbidity, 61-120 = moderate turbidity, >120 = marked turbidity. This value correlates weakly to triglyceride (lipid) concentrations. Comment: Hemolysis is an approximate measure of the hemoglobin concentration in mg/dL. This value correlates to visual estimates of hemolysis as follows <20 = no hemolysis, 20-100 = mild hemolysis, 101-300 = moderate hemolysis, >300 = marked hemolysis. Comment: Icterus is an approximate measure of the total bilirubin concentration in mg/dL. This value will be increased by non-bilirubin chromogens (e.g. carotenoids). This degree of icterus may affect the following results: FALSELY DECREASED: cholesterol, creatinine, triglycerides			
2	CHILI BA - Equine Test Name	Result	Reference Interval	Units
	Serum			
	Bile Acids, Random	84 (H)	0 - 12	umol/L
	Lipemia	9	Not established	
	Hemolysis	2	Not established	
	Icterus	10	Not established	

>20 = hepatobiliary disease

Report Date: 3/3/2011 2:18:55PM

Worked in Devos 3/4/11



March 8, 2011

VetScan VS2

Equine Profile Plus

Patient ID: 9137872

03-08-2011 04:00 PM

Rotor Lot Number: 3374804

Sample Type: Horse

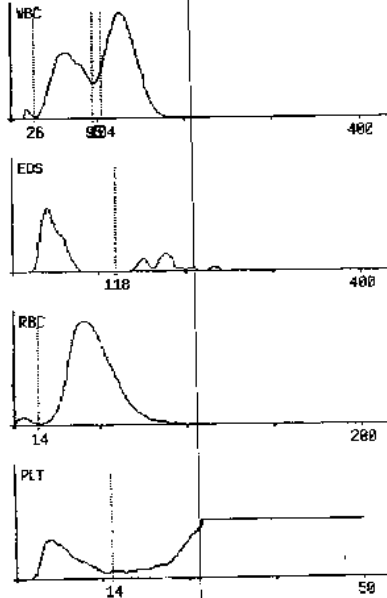
Serial Number: 0830V05700

Na+	130	mmol/L	128	146	TBIL	2.1	mg/dL	0.5	2.3	
K+	4.2	mmol/L	2.5	5.2	EST	149 +	U/L	5	24	
tCO2	32	mmol/L	20	33	ALB	3.1	g/dL	2.2	3.7	
CK	168	U/L	120	479	TF	7.0	g/dL	5.7	8	
GLU	185	mg/dL	85	110	GLOB	3.8	g/dL	2.7	5	
CA	---	ng/dL	11.5	14.2	DC	OK				
BUN	17	mg/dL	7	25	HEM	0	LIP	0	ICT	0
CRE	1.1	mg/dL	0.6	2.2						
AGI	513 +	U/L	175	348						

Calcium re-run : 13.1 (WNL)

SmpID	55	Spec	Horse
PtID	9137872	Doctor	Best
Name	Bialecki, CHILLI	Age/Sex	14 years / Neutered
Test Date	03.08.2011 04:02 PM	S/H	752017
Report Date	03.08.2011 04:28 PM		

WBC	7.44	10 ⁹ /L	5.4	14.3
LYM	2.88	10 ⁹ /L	1.5	7.7
MON	0.38	10 ⁹ /L	0	1.5
NEU	4.12	10 ⁹ /L	2.3	9.5
EOS	0.05	10 ⁹ /L	0	1
BAS	0.01	10 ⁹ /L	0	0.3
LY%	38.7	%	17	68
MO%	5.1	%	0	14
NE%	55.4	%	22	88
EO%	0.7	%	0	18
BA%	0.1	%	0	2
RFP	8.68	10 ¹² /L	6.8	12.9
HGB	14.3	g/dL	11	19
HCT	40.35	%	32	53
MPV	47	fL	37	59
MCH	16.6	pg	12.3	19.7
MCHC	35.5	g/dL	31	39
RDWc	22.2	%		
PLT	169	10 ⁹ /L	100	480
PCT	0.11	%		
MPV	6.8	fL		
PDW	35.8	%		

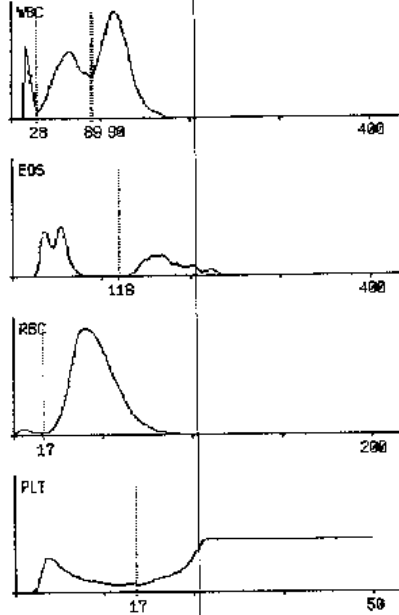


*faxed to
Dr. Lenzman
3/16/11 @ 2:34 pm.*

Royalton Equine Veterinary Services, PC
7735 Chestnut Ridge Rd.
Lockport, NY 14894
(716) 829-8334

Sample	58	Mode	Horse
PatID	9137872	Doctor	Best
Name	Blalock, Chilli	Age/Sex	14 years / Neutered
Text date	03.14.2011 01:17 PM	S/N	252017
Report date	03.14.2011 01:30 PM		

WBC	6.22	10 ⁹ /l	5.4	14.3
LYM	2.38	10 ⁹ /l	1.5	7.7
MDM	0.88	10 ⁹ /l	0	1.5
NEU	3.65	10 ⁹ /l	2.3	9.5
EOS	0.09	10 ⁹ /l	0	1
BAS	0.02	10 ⁹ /l	0	0.3
LY%	38.5	%	17	68
MD%	1.2	%	0	14
NE%	58.6	%	22	80
EO%	1.4	%	0	10
BA%	0.3	%	0	2
REC	8.60	10 ¹² /l	6.8	12.9
HGB	14.2	g/dl	11	19
HCT	48.00	%	32	53
PCV	47	fl	37	59
MCH	16.5	pg	12.3	16.7
MCHC	35.4	g/dl	31	39
RDW	22.0	%		
PLT	164	10 ⁹ /l	100	409
PCT	0.13	%		
MPV	7.9	fl		
PDW	48.0	%		



VetScan VS2

Equine Profile Plus

14 Mar 2011 01:20 PM
Sample Type: Horse

Patient ID: 9137872
Rotor Lot Number: 037H894
Serial Number: 0003v02700

NA+	134	mmol/L	126	146
KA-	4.1	mmol/L	2.5	5.2
CO2	31	mmol/L	20	33
UK	248	U/L	120	470
BLU	101	mg/dL	25	110
CA	11.5	mg/dL	11.5	14.2
BUN	17	mg/dL	?	25
CRE	1.3	mg/dL	0.6	2.2
FST	392	U/L	175	348

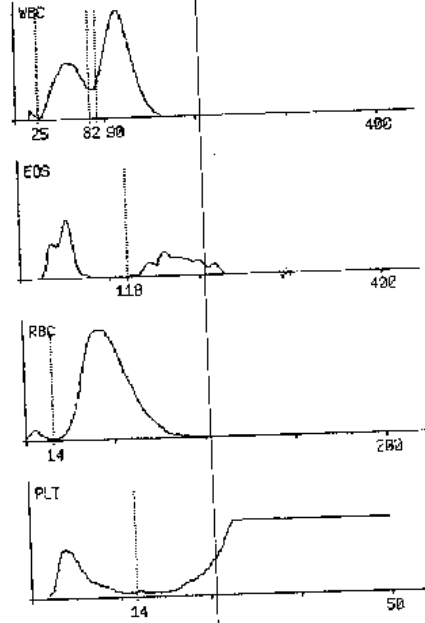
TBIL	2.3	mg/dL	0.5	2.3	
SGT	126	U/L	5	24	
ALB	3.2	g/dL	2.2	3.7	
TP	6.8	g/dL	5.7	8	
GLOB	3.6	g/dL	2.7	5	
GC	OK				
HEM	0	LIP	0	ICT	0

collected ✓

Royalton Equine Veterinary Services, PC
 7735 Chestnut Ridge Rd.
 Lockport, NY 14094
 (716)629-8384

SNIPID 65 Mode
 PatID 9137872 Doctor
 Name Blaieck, CHILL Age/Sex 14 years / Neutered
 Test date 03.29.2011 02:41 PM S/N
 Report date 03.29.2011 02:42 PM 252017

WBC	6.47	10 ⁹ /L	5.4	14.3
LYM	2.22	10 ⁹ /L	1.5	7.7
MCH	0.25	10 ⁹ /L	0	1.5
NEU	3.89	10 ⁹ /L	2.3	9.5
EOS	0.09	10 ⁹ /L	0	1
BAS	0.02	10 ⁹ /L	0	0.3
LY%	34.4	%	17	68
MCH%	3.9	%	0	14
NEU%	60.1	%	22	80
EOS%	1.4	%	0	10
BAS%	0.1	%	0	2
REC	7.24	10 ¹² /L	6.8	12.9
HGB	12.0	g/dL	11	19
ICT	34.20	%	32	53
HCV	47	fL	37	58
MCH	16.5	pg	12.3	19.7
MCHC	35.1	g/dL	31	39
RDWc	22.7	%		
PLT	157	10 ⁹ /L	100	400
PCT	0.10	%		
MPV	6.5	fL		
PDWc	93.0	%		



VetScan VS2

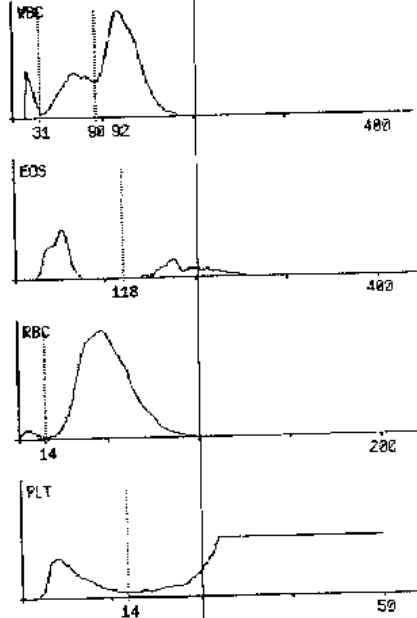
Equine Profile Plus Patient ID: 9137872
 29 Mar 2011 02:33 PM Rotor Lot Number: 0374884
 Sample Type: horse Serial Number: 0000065700

Na+	132	mmol/L	126	148
K+	3.9	mmol/L	2.5	5.2
LDH2	32	mmol/L	20	33
CK	233	U/L	120	470
BUN	64	mg/dL	35	110
UA	12.5	mg/dL	1.5	14.2
BUN	17	mg/dL	7	25
CRE	1.2	mg/dL	0.6	2.2
AST	267	U/L	175	340
TRIL	2.0	mg/dL	0.5	2.3
GGT	72	U/L	5	124
ALB	3.0	g/dL	2.2	3.7
TP	6.4	g/dL	5.7	8
GLOB	3.4	g/dL	2.7	5
OC	OK			
HEM 0	LIP 0			
ICT 0				

Royalton Equine Veterinary Services, PC
 7735 Chestnut Ridge Rd.
 Lockport, NY 14094
 (716)629-8384

SmpID 99 Mode Horse
 PatID 9 Doctor Best
 Name Bialecki,CHLU Age/Sex 14 years / Neutered
 Test date 06.03.2011 06:53 PM S/H 25200.7
 Report date 06.03.2011 07:41 PM

WBC	7.35	10 ⁹ /l	5.4	14.3
LYM	1.97	10 ⁹ /l	1.5	7.7
MON	0.09	10 ⁹ /l	0	1.5
NEU	5.19	10 ⁹ /l	2.3	9.5
EOS	0.07	10 ⁹ /l	0	1
BAS	0.01	10 ⁹ /l	0	0.3
LY%	26.9	%	17	68
MON%	1.3	%	0	14
NE%	70.7	%	22	80
EOP%	1.0	%	0	10
BAS%	0.2	%	0	2
RBC	6.20	10 ¹² /l	6.8	12.9
HGB	13.4	g/dl	11	19
HCT	41.06	%	32	53
MCV	50	fl	37	59
MCH	16.3	pg	12.3	19.7
MCHC	32.6	g/dl	31	39
RDWc	23.5	%		
PLT	153	10 ⁹ /l	100	400
PCT	0.11	%		
MPV	7.3	fl		
PDWc	36.6	%		



VetScan 452

Equine Profile Plus
 03 Jun 2011 06:49 PM
 Sample Type: Horse

Patient ID: S
 Rotor Lot Number: 0452394
 Serial Number: 0000166790

MA+	138	mcg/L	126	146
K+	4.8	mmol/L	2.5	5.2
UCD	28	mcg/L	20	33
CK	239	U/L	120	470
ALU	108	mg/dL	65	110
CA	15.8	mg/dL	11.5	14.2
BUH	17	mg/dL	7	25
CRE	1.1	mg/dL	0.8	2.2
GST	231	U/L	175	340

TBIL	1.5	mg/dL	0.5	2.3
GGT	25	U/L	5	24
ALB	3.3	g/dL	2.2	3.7
TP	7.1	g/dL	5.7	8
GLOB	3.7	g/dL	2.7	5

QC OK
 HEM 1+ LIP 0 ICT 0

Shirley Spalding

VetScan VS2

Equine Profile Plus

Patient ID: 9137072

14 Jul 2011 04:18 PM

Rotor Lot Number: 0452804

Sample Type: Horse

Serial Number: 000005700

Sample Type: Horse Serial Number: 000005700

NA+	131	no/L 120		148	TBIL	1.4	mg/dL 0.5		2.3	
K+	4.6	mmol/L 2.5		5.2	GGT	15	U/L 5		24	
tCO2	28	mmol/L 20		33	ALB	3.1	g/dL 2.2		3.7	
CK	157	U/L 120		470	TP	8.8	g/dL 5.7		0	
GLU	117	mg/dL 80		118	GLOB	3.7	g/dL 2.7		5	
CA	13.0	mg/dL 11.5		14.2	QC	OK				
BUN	17	mg/dL 7		25	HEM	0	LIP	0	ICT	0
CRE	1.1	mg/dL 0.8		2.2						
AST	232	U/L 175		348						

Throughout all of the blood work, the white cells count had remained in the lowest range of normal. In June, this was shifting and the Neutrophils were finally increasing to a more normal number.

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