

# History of the Case

Name: Arlington Bulavinetz  
 Age: 10 years  
 Breed: Dachshund  
 Sex: Male                      Altered: Yes

Dog's lifestyle/occupation: **Pet. Single level home. Fenced yard. Also walked in the neighborhood dog park.**

Brief history of dog's family history (i.e. adopted from Humane Society, owner has owned since puppy, etc): **Owner has had Arlington since he was a puppy.**

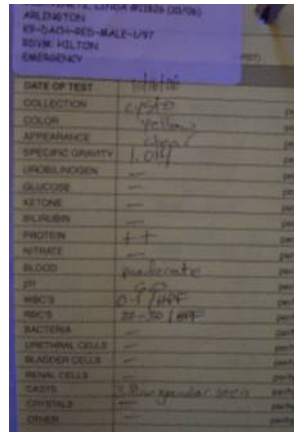
Brief history of problem in which dog is referred for (i.e. date of injury or onset of problem, how owners' noticed a problem, type of problem noticed): **In October of 2006 Arlington acutely developed cervical pain and tetraplegia. My co-worker, Dr. J.M. Fingerroth, performed a cervical myelogram and C4-C5 ventral slot to alleviate his pain.**

Interventions (i.e. medication, restrictions, exercise, rest, etc.):  
**Medications: Amantadine, famotidine, carafate.**  
**Restrictions: staples still present in incision – avoid getting wet**  
**Exercise: Crate rest only**

Referring veterinarian's diagnosis: **C4-5 IVDD, S/P C4-5 ventral slot**

Test Results (please include a photograph or digital picture of the appropriate test):

HEMATOLOGY			
RBC	7.66	$\text{mm}^3$	6.0-17.0
RBC ANISO 1+	7.04	$10^6/\mu\text{L}$	5.5-2.3
HGB	6.8	g/dL	12.0-18.0
HCT	30.0	%	37.0-55.0
MCV	71.0	$\mu\text{L}$	60-77
MCH	23.8	pg	19.5-24.5
MCHC	33.5	g/dL	33-36
RDW	16.50	%	14-19
PLATELETS	288.0	$10^3/\mu\text{L}$	130-400
NEUTROPHILS		%	60-70
NEUTROPHILS #	6.870	$\text{mm}^3$	3.6-13.0
LYMPHOCYTES %		%	12-30
LYMPHOCYTES #	0.836	$\text{mm}^3$	0.3-5.1
MONOCYTES %		%	3-12
MONOCYTES #		$\text{mm}^3$	0.2-1.7
EOS%#	2.45	%	2-10
EOSINOPHIL#	0.188	$\text{mm}^3$	0.7-1.8
BASOPHILS%	0.00	%	0-2
BASOPHILS#	0.000	$\text{mm}^3$	0-2
CHEMISTRY			
TOTAL PROTEIN	7.0	g/dL	6.0-7.8





Surgery (if appropriate):

Type of procedure: **C4-C5 ventral slot**

Date: **17 October 2006 (Dr. Fingerorth does not routinely write a formal surgery report but includes pertinent details in the referral letter.**

Special surgical precautions: **none provided by surgeon**

**VETERINARY SURGEON** [www.vetspecialistsofrochester.com](http://www.vetspecialistsofrochester.com)  
[www.animalemergencyservice.com](http://www.animalemergencyservice.com)

October 23, 2006

Dr. Dan Lenhard  
Hilton

Dear Dr. Lenhard:

This is in reference to Arlington, the Dachshund owned by Linda Bulavinetz. Arlington had a past history of paraplegia due to an intervertebral disc rupture in the back. The dog apparently recovered from injury although still had some residual deficits. Arlington was admitted back to the Emergency Service at Veterinary Specialists because of neck pain and now tetraparesis/tetraplegia. The dog was treated intensively with medications but failed to respond. Pursuant to conversations between the attending emergency clinicians and the client arrangements were made to refer Arlington to the surgical service for treatment.

Arlington was anesthetized and a myelogram was performed. The myelogram revealed severe spinal cord compression owing to a ruptured intervertebral disc between the 4<sup>th</sup> and 5<sup>th</sup> cervical vertebrae. Based on this finding and a conversation with the client Arlington was then taken to the operating room for spinal cord decompression through a ventral slot approach. The offending disc material was removed from the C4-C5 canal. The spinal cord appeared to be fully decompressed at the end of the operation. We noted on the myelogram that Arlington had calcified discs also at C3-C4, and C5-C6. Neither of these discs herniated at this point, but we felt it prudent to prophylactically fenestrate them at time of decompressive surgery.

Arlington's neurological status has been unchanged so far since the operation. The dog has been closely monitored in the hospital and started on a rigorous program of rehabilitation and physical therapy. Arlington certainly seems more comfortable to us now after surgery than he was prior to the operation.

Eventually Arlington's care was transferred up to the Animal Rehabilitation Center in Greece, New York. Our understanding is that he is spending days there and then going home with the owners at night.

Our plan is to continue to follow Arlington's recovery over time in concert with the rehabilitation service. I remain hopeful that the dog will recover from this recent spinal cord injury, but the time frame is difficult to predict. Arlington is due for staple removal on October 27<sup>th</sup>, and this is a service that can be provided either at the rehabilitation service or here.

I hope this information has been useful to you. If I can be of additional assistance please contact me.

Sincerely,

James M. Fingerorth, DVM, ACVS Board-Certified Surgeon  
JMF/ise  
cc: Owner  
825 White Spruce Blvd. Rochester, NY 14623 Phone: 585-424-1277 Fax: 585-424-1335

**Past medical history: Arlington had a herniated disc at T13-L1 that I performed surgery on in January of '05. He had sensation but no motor function prior to surgery. He recovered limb function about 3 weeks after surgery. His co-ordination continued to improve over the next several months but remained mildly ataxic.**

# Evaluation

Observation **Neck shaved, staples in place.**

Gait Assessment (if lameness present[0-4] indicate degree and limbs – utilize the lames scale you commonly use and site the source). **tetraplegic**

PROM – Affected joints with a comparison to uninvolved joints. **Normal for all joints. Muscles had mild-moderate tone.**

Neurological testing (all appropriate neurological testing, results, and meaning of the outcomes): **Tetraplegia. UMN reflexes on all limbs. UMN bladder. These symptoms were consistent with the surgically treated lesion at C4-C5.**

Pain assessment [0-10] (using pain assessment scale from, Matthews, K.A., *Pain assessment and general approach to management*, Management of Pain, The Veterinary Clinics of North America, Small Animal Practice, July 2000, p. 729-755): **Arlington was difficult to evaluate as he was a fear biter. Some of this ‘aggression’ was probably in anticipation of being handled while uncomfortable after surgery. I would hedge and give him a 5/10 simply because he was only a day post-op, but he was freely swinging his head around to bite so he was obviously much more comfortable than he was prior to surgery.**

Assessment: **Tetraparetic. Fear-biter. Mild paraspinal muscle atrophy (probably residual from previous problem).**

Goals: **pain relief, restoration of mobility**

Treatment Plan:

- Home exercise program
  - **Cryotherapy at incision (10minutes TID until staple removal)**
  - **Heat cervical muscles (10 minutes TID)**
  - **PROM/stretching of all limbs/joints (10-15 reps q2h)**
  - **AROM of C-spine – encourage cervical mobility by ‘tracking’ with treats**
  - **Assisted swimming (with Ruffwear™ PFD) for up to 5 minutes when it can be managed**
  - **Standing exercises (q2h) performed over a rolled towel**
    - **Weight shifts – side-to-side and front-to-back**
    - **Diagonal stands**
    - **Single leg stands**
      - **Bouncing and weight-shifting on each limb**

**This schedule was maintained by the owner for 4 weeks. She was off work at the time and able to maintain a consistent routine with him. After that first month she was developing some soreness in her hands and wrists from supporting him (and he had bitten her twice). She also reported that he had become strong enough to push himself up with his front legs. We decided to utilize one of our Eddie’s Wheels carts for his support system instead of the**

**rolled towel to alleviate some of the owner's physical issues. We were still unable to touch him so the owner put him in the cart for fitting. It was a reasonably good fit, requiring minimal adjustment. From the end of November, 2006 to early January, 2007 all of the above exercises were performed with Arlington in the cart. He required frequent rest periods because of lack of strength and endurance. By the holidays in December he had become strong enough to start walking in the cart. Motor function was present in his rear limbs but he was still paretic.**

- Program within clinic or hospital N/A
- Instructions for technicians/assistants
- Turning schedule **q4h initially as he was less mobile**
- Gait schedule

## Actual History of Treatment

Please provide descriptions of the individual treatments in S.O.A.P. format. In addition, please include photographs of the dog during treatment.

**2 January 2007**

**Subjective** Since surgery rehab exercises have been done at home by 'mom' as Arlington's personality has limited interaction with strangers. He was initially tetraplegic. He has regained enough strength and function to support himself in a cart for brief periods (up to 30 seconds) if he has good footing. He has had some exposure to water and a PFD on a regular basis (at least twice a week initially, but almost daily for the last few weeks). He is starting to use his cart for motion instead of just support so 'mom' is interested in getting him in the UWT if he'll tolerate having us around him. He developed a UTI in November that resolved with antibiotic therapy.

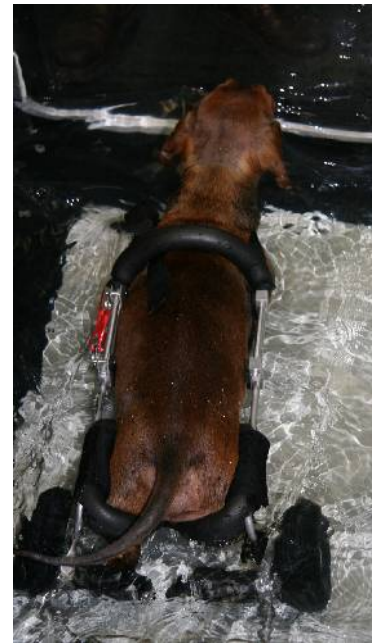
**Objective**

- ❑ Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 3 minutes (1minute swim with rest x3). Lowered water to shoulder height and placed him in his cart at 0.5mph for 5 minutes**
  - Manual intervention
- ❑ Owner education **Monitor for soreness, changes in urination pattern**
- ❑ Home exercise program **previous exercises performed 3x daily**
- ❑ Program within the hospital **outpatient treatments**
- ❑ Measurable outcomes **N/A**
- ❑ Observation of gait pattern, function, etc. **When swimming he would utilize his forelimbs but not his rear. The PFD permitted assisted swimming motion in the rear limbs. He was mostly tolerant of this activity. Once in the cart with the tread moving he actively participated in walking. He needed assistance properly placing his rear limbs. He was much more tolerant of this interaction than he was of swimming assistance.**

**Assessment S/P C4-5 ventral slot**

- ❑ Progress **None**
- ❑ Deficits remaining from initial plan **Paraparesis**
- ❑ Assessment of barriers **Arlington's personality is restricting pro-active interactions by staff. His tolerance for interactions with his 'mom' is acceptable.**
- ❑ Remaining problems and goals **paraparesis; improve mobility**

**Plan – plan of care for next visits UWT**



## **5 January 2007**

**Subjective Arlington was very tired after his last UWT session. He slept for several hours that afternoon. He did not seem obviously sore to 'mom' afterwards. He has tolerated his home therapy program as before.**

### **Objective**

- ❑ Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 3 minutes (1minute swim with rest x3). Lowered water to shoulder height and placed him in his cart at 0.5mph for 5 minutes**
  - Manual intervention
- ❑ Owner education **Monitor for soreness, changes in urination pattern**
- ❑ Home exercise program **unchanged**
- ❑ Program within the hospital **outpatient treatments**
- ❑ Measurable outcomes **N/A**
- ❑ Observation of gait pattern, function, etc. **Unchanged**

### **Assessment S/P C4-5 ventral slot**

- ❑ Progress **None**
- ❑ Deficits remaining from initial plan **Paraparesis**
- ❑ Assessment of barriers **Unchanged**
- ❑ Remaining problems and goals **paraparesis; improve mobility**

**Plan – plan of care for next visits UWT**

## **9 January 2007**

**Subjective Arlington was, again, tired after his last visit but recovered quickly. He has been much stronger at home since that visit. He does not need the cart to walk around the house where there is good traction. Turns/corners are difficult, as are slippery floors. His right pelvic limb is lagging behind the others in recovery. The owners estimate that he is about 65% back to where he was prior to surgery with respect to mobility.**

### **Objective**

- ❑ Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 3 minutes (1minute swim with rest x3). Lowered water to shoulder height and placed him in his cart at 0.5mph for 5 minutes**
  - Manual intervention
- ❑ Owner education **Monitor for soreness, changes in urination pattern**
- ❑ Home exercise program **unchanged**
- ❑ Program within the hospital **outpatient treatments**
- ❑ Measurable outcomes **N/A**
- ❑ Observation of gait pattern, function, etc. **Arlington was actively moving all of his limbs during his swimming sessions today. He seemed eager to participate in the exercise. When in the cart he gaited well, needing no assistance in placement of his feet.**

### **Assessment S/P C4-5 ventral slot**

- ❑ Progress **Significantly improved motor function**
- ❑ Deficits remaining from initial plan

- Assessment of barriers **Unchanged**
- Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT without the cart**

**16 January 2007**

Subjective **Arlington was not as tired after his last visit but recovered quickly. Is otherwise unchanged in his mobility.**

Objective

- Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 3 minutes (1minute swim with rest x3). Lowered water to shoulder height and walked at 0.5mph for 5 minutes**
- Owner education **Monitor for soreness, changes in urination pattern**
- Home exercise program **unchanged**
- Program within the hospital **outpatient treatments**
- Measurable outcomes **N/A**
- Observation of gait pattern, function, etc. **Arlington was actively moving all of his limbs during his swimming sessions again today. When walking on the tread he gaited relatively well, but tired near the end and need assistance in placement of his feet.**



Assessment **S/P C4-5 ventral slot**

- Progress **no significant change**
- Deficits remaining from initial plan
- Assessment of barriers **Unchanged**
- Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT – increase duration of activities**

**24 January 2007**

Subjective **Arlington has become much more active at home. He is stronger on his right pelvic limb than he has been and the owner does not see it ‘give out’ on him as often. He is having fewer problems with slippery floors, turns and corners.**

Objective

- Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 4.5 minutes (1.5minute swim with rest x3). Lowered water to shoulder height and walked at 0.5mph for 5 minutes**
  - Manual intervention
- Owner education **Monitor for soreness, changes in urination pattern**
- Home exercise program **unchanged**

- ❑ Program within the hospital **outpatient treatments**
- ❑ Measurable outcomes **N/A**
- ❑ Observation of gait pattern, function, etc. **Arlington did well in the water again. He tired near the end but this time needed no assistance in placement of his feet.**

Assessment S/P C4-5 ventral slot

- ❑ Progress **stronger and improved endurance**
- ❑ Deficits remaining from initial plan
- ❑ Assessment of barriers **Unchanged**
- ❑ Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT**

**29 January 2007**

Subjective **No major changes. His right pelvic limb may be doing a bit better still.**

Objective

- ❑ Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 4.5 minutes (1.5minute swim with rest x3). Lowered water to shoulder height and walked at 0.5mph for 5 minutes**
  - Manual intervention
- ❑ Owner education **Monitor for soreness, changes in urination pattern**
- ❑ Home exercise program **unchanged**
- ❑ Program within the hospital **outpatient treatments**
- ❑ Measurable outcomes **N/A**
- ❑ Observation of gait pattern, function, etc. **Unchanged**

Assessment S/P C4-5 ventral slot

- ❑ Progress **stronger and improved endurance**
- ❑ Deficits remaining from initial plan
- ❑ Assessment of barriers **Unchanged**
- ❑ Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT – increase duration of activities**

**10 February 2007**

Subjective **No major changes. The deterioration of the weather has forced him inside for all activities.**

Objective

- ❑ Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 6 minutes (2minute swim with rest x3). Lowered water to shoulder height and walked at 0.5mph for 7.5 minutes**
  - Manual intervention
- ❑ Owner education **Monitor for soreness, changes in urination pattern**
- ❑ Home exercise program **unchanged**
- ❑ Program within the hospital **outpatient treatments**
- ❑ Measurable outcomes **N/A**
- ❑ Observation of gait pattern, function, etc. **Unchanged**

#### Assessment S/P C4-5 ventral slot

- ❑ Progress **stronger and improved endurance**
- ❑ Deficits remaining from initial plan
- ❑ Assessment of barriers **Unchanged**
- ❑ Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT**

#### **17 February 2007**

Subjective **Arlington seems a bit weaker on his right pelvic limb this past week. He has done more walking in the snow and this surface seems to tire him out faster and the owners see the limb collapse on him more often. Otherwise things seem unchanged.**

#### Objective

- ❑ Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 6 minutes (2minute swim with rest x3). Lowered water to shoulder height and walked at 0.5mph for 7.5 minutes**
  - Manual intervention
- ❑ Owner education **Monitor for soreness, changes in urination pattern**
- ❑ Home exercise program **unchanged**
- ❑ Program within the hospital **outpatient treatments**
- ❑ Measurable outcomes **N/A**
- ❑ Observation of gait pattern, function, etc. **Arlington tired during his 2 minute swim sessions and needed longer rest periods to recover. He was quite fatigued by the end of the entire session.**

#### Assessment S/P C4-5 ventral slot

- ❑ Progress **none**
- ❑ Deficits remaining from initial plan
- ❑ Assessment of barriers **Unchanged**
- ❑ Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT – increase duration of activities if recovery from today in uneventful**

#### **24 February 2007**

Subjective **No significant changes. Recovered quickly from the last visit without obvious discomfort. The right pelvic limb is still lagging behind the others in strength and endurance.**

#### Objective

- ❑ Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 6 minutes (2minute swim with rest x3). Lowered water to shoulder height and walked at 0.5mph for 9 minutes**
  - Manual intervention
- ❑ Owner education **Monitor for soreness, changes in urination pattern**
- ❑ Home exercise program **unchanged**
- ❑ Program within the hospital **outpatient treatments**

- Measurable outcomes N/A
- Observation of gait pattern, function, etc. **No problems noted today with endurance.**

Assessment S/P C4-5 ventral slot

- Progress **none**
- Deficits remaining from initial plan
- Assessment of barriers **Arlington has become very tolerant of our interactions. He is eager to get in the UWT.**
- Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT – increase duration of activities**

**6 March 2007**

Subjective **No significant changes.**

Objective

- Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 6 minutes (2minute swim with rest x3). Lowered water to shoulder height and walked at 0.5mph for 11 minutes**
  - Manual intervention
- Owner education **Monitor for soreness, changes in urination pattern**
- Home exercise program **unchanged**
- Program within the hospital **outpatient treatments**
- Measurable outcomes N/A
- Observation of gait pattern, function, etc. **No problems noted today with endurance.**

Assessment S/P C4-5 ventral slot

- Progress **endurance is improving**
- Deficits remaining from initial plan
- Assessment of barriers
- Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT – lower water, increase duration of activities**

**14 March 2007**

Subjective **Arlington is going for longer walks outside now that the snow has melted. He had his last recheck with Dr. Fingerroth earlier this week and is not required to return.**

Objective

- Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 6 minutes (3 minute swim with rest x3). Lowered water to elbow height and walked at 0.5mph for 11 minutes**
  - Manual intervention
- Owner education **Monitor for soreness, changes in urination pattern**
- Home exercise program **unchanged**
- Program within the hospital **outpatient treatments**
- Measurable outcomes N/A

- ❑ Observation of gait pattern, function, etc. **No problems noted today with endurance.**

Assessment S/P C4-5 ventral slot

- ❑ Progress **endurance is improving**
- ❑ Deficits remaining from initial plan
- ❑ Assessment of barriers
- ❑ Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT – increase duration of activities**

**21 March 2007**

**Subjective Arlington had a minor set back 2 nights ago – he was dragging his right pelvic limb that evening. By the following morning he was back to his previous status.**

Objective

- ❑ Treatment and parameters
  - Modalities
  - Therapeutic exercise **Controlled swimming in UWT for 6 minutes (3 minute swim with rest x3). Lowered water to elbow height and walked at 0.5mph for 12 minutes**
  - Manual intervention
- ❑ Owner education **Monitor for soreness, changes in urination pattern**
- ❑ Home exercise program **unchanged**
- ❑ Program within the hospital **outpatient treatments**
- ❑ Measurable outcomes **N/A**
- ❑ Observation of gait pattern, function, etc. **No problems noted today with endurance.**

Assessment S/P C4-5 ventral slot

- ❑ Progress **endurance is improving**
- ❑ Deficits remaining from initial plan
- ❑ Assessment of barriers
- ❑ Remaining problems and goals **ataxia; improve mobility**

Plan – plan of care for next visits **UWT – increase duration of activities**

## Discussion

How many visits? **13 (to date)**

Veterinarian feedback: **None provided**

Owner compliance: **Owner was very compliant with all exercises and schedules. She was unable to perform NMES because Arlington was intolerant of it. She was hesitant to attempt activities such as the wobble board or theraball because of his tendency to bite, especially when insecure.**

How do you feel physical therapy made a difference in this particular case? **Arlington's home care in the post-operative period helped keep his joints and soft tissues mobile while he was non-ambulatory. The proprioceptive exercises probably helped stimulate early use of the limbs. The UWT provided a physical and psychological stimulus for improved mobility and endurance.**

What is your speculation of the case if the patient did not receive physical therapy? **Ultimately he would probably have regained his mobility but rehab brought that about faster. He made consistent progress during his home treatments and significant jumps in progress during his water activities.**

What could have been altered in the physical therapy care of this case? **It would have helped with proprioceptive re-education if activities such as the wobble board and theraball could have been included. NMES would also have helped improve muscle mass and tone. Earlier UWT exposure may have facilitated earlier return to function. Unfortunately Arlington's personality and, initially, the owner's financial constraints restricted this.**

Where there any barriers to the outcome of the case? **Arlington's personality was the biggest impediment to treatment.**

How was billing performed in this case? **Daily as services were rendered.**