

# Rounds

Animal Health  
Department

Medical Rounds

"medicine for all"



*Caring for Stranded Marine Animals*

NATIONAL  
MARINE  
L I F E  
CENTER

# Notes

Veterinary Research  
Department

Under the microscope

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Rounds Notes is a report on the health of animals at the National Marine Life Center from Sea Rogers Williams VMD for the staff, volunteers, and community of the center including professionals involved the captive care of similar species, the views expressed are not necessarily that of NMLC. Information in Rounds Notes should be considered confidential and used solely to benefit the health of aquatic animals everywhere.

NOVEMBER 28, 2012

*Rounds Notes*

8: 25-29(2011)

## Headlines News: Surgery Successful, So Far, So Good special thanks the specialists for special care and skill



Thanks, to the special team at our partner organization Cape Cod Veterinary Specialists in particular Drs. Ed Kochin VMD DACVS and Louisa Rahilly DVM DACVECC, Jess and Trina, Jen McCoy/Boston, and the whole CCVS team who were fantastic. The NMLC team of myself, Dr. Andy Voorhis, and Kate Shaffer got the seal in and out in less then 2.5 hours, surgery was 50 min., anesthesia 1.5 hours. Nice work all, thanks again-Rogers

## Left Ventral Bulla Osteotomy:

AM PE: BAR, NPO overnight, HR 60 sinus arrhythmia, RR= 20 apneustic, no aural d/c, BS=3.5/5, other PE WNL, A: OK for general anesthesia and surgery. weight 35kg.

### Anesthesia

PreOp (Williams) 8:42 am @ NMLC

midazolam 1cc (code M8) IM

glycopyrrolate 3cc IM

meloxicam 0.7cc (5mg/ml) IM

buprex 2 cc (code B5,B6) IM

transport to CCVS in crate (Shaffer)

induction 9:16 am

HR= 120 bpm, lungs clear

8cc propofol slow IV dorsal sinus (Williams)

intubated #28 first attempt, PPV 8-16 bpm

to 20-25 cc H2O

attempt at U/S guided 14g over the needle jugular catheter was unsuccessful

placed 18g 2" catheter in the dorsal sinus and sutured in place, laid down on skin (9:35am Williams)

maintenance fluids, LRS @ 400ml/hr IV

Anesthesia was turned over the CCVS team (Rahilly)

Ventilator or PPV by hand

RR 8 bpm, tidal volume 8ml/kg 240

ml minute ventilation of 1.9L

increased RR=14 and tidal volume

to 325 to address hypercapnea.

CRI Dobutamine 1 mcg/kg/min = 1 ml/hr

(3.6ml dobutamine in 21.4 ml

0.9%NaCl - start at 4ml/hr

CRI Midazolam 0.3 mg/kg/hr

(0.1 mg/kg/hr = 1 ml/hr)

### Monitor

1) arterial line placed for iStat CG8 blood gases (3 samples) and direct arterial pressure, moderate hypertension with a mean pressure of 140-160mmHg was noted.

2) continuous ECG, SaO2, etCO2, temp [SurgiVet]

Anesthesia Note: No episodes of the marine mammal dive reflex were encountered, and this is likely due to the maintenance of a light plain of anesthesia, judicious use of sevoflurane made



possible with the midazolam CRI, use of glycopyrrolate over atropine, and the use of a sympathomimetic, CRI Dobutamine (predominantly beta effect).

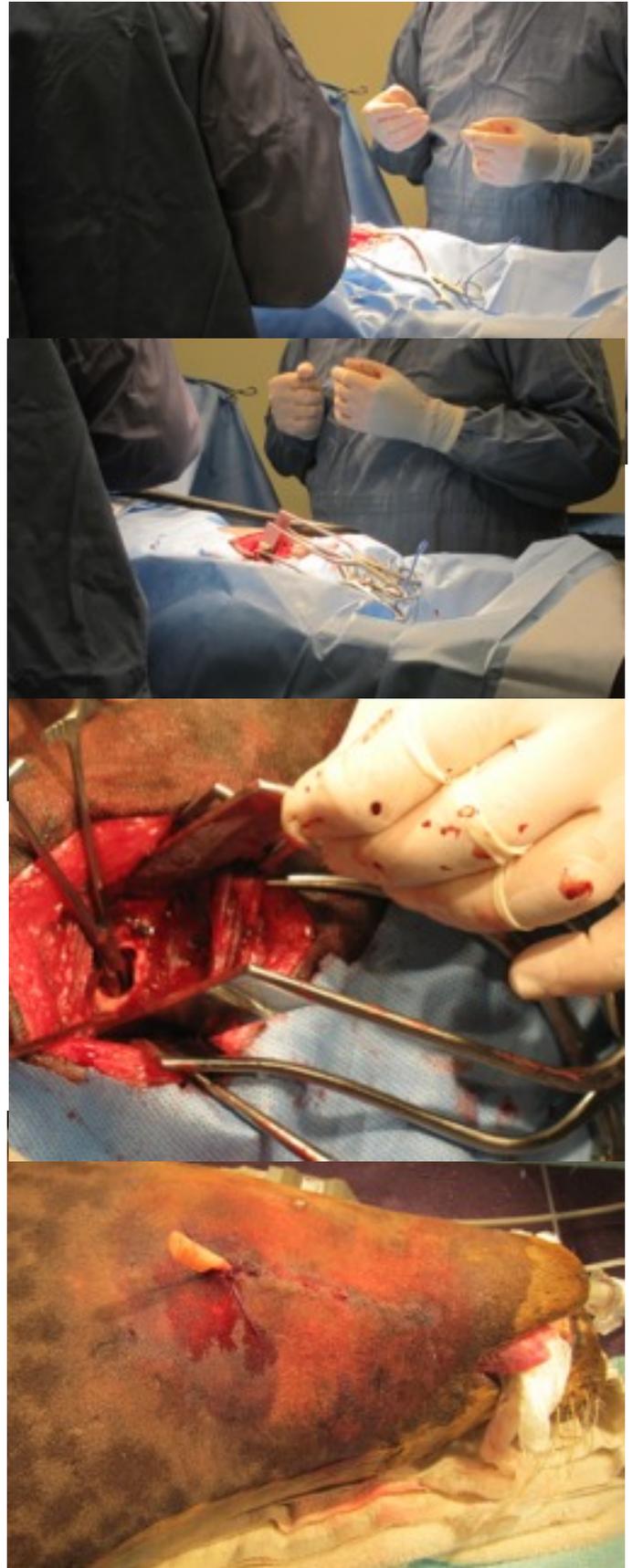
Note on ventilation during the procedure, the pCO<sub>2</sub> was as high as 130 mmHg and seals appear to be more tolerant of elevated carbon dioxide levels which may not drive respiration in the same manner as companion animals, as these levels would be of great concern in companion animal anesthesia. Also, while the SaO<sub>2</sub> was in the 80's pO<sub>2</sub> was in the 90's, seals have a different hemoglobin then companion animals and the calibration of pulse oximeters may not provide accurate assessment of tissue oxygenation, although in previous surgeries I have noted SaO<sub>2</sub>s in the high 90s they are typically much lower 70-80s in animals that have done well with anesthesia.

**Surgery** (Kochin with Williams assistance)

9:45 - 10:35 am 50 min

left sided ventral bulla osteotomy.

- 1) 7cm skin and blubber incision over the bulla identified by palpation, approx. 3 cm left of the midline.
- 2) electro-cautery to control hemorrhage in the blubber layer
- 3) electro-cautery dissection to the s-platysma muscle, place Gelipi retractors
- 4) sharp and electro-cautery through a layer of tortuous vessels, loose connective tissue and the s-styloglossal and s-hypoglossal muscles, and s-digastricus, place Weitlander retractors
- 5) identified and protected the lingual nerve, moved medially (opposed to canines, usually moved laterally)
- 6) identified the internal carotid artery
- 7) expose the ventral bulla with periosteal elevator, use of suction to clear surgical field
- 8) place Meyerding/Rogers retractor to expose the bulla, suction and an assistant are used to clear the field for the osteotomy
- 9) nitrogen powered surgical burr (pineapple, 3mm) to enter the bulla and enlarge
- 10) Suction is used to keep the surgical field clear, the bulla oozed blood until the mucoperiosteum was removed, culture swab collected.



- 11) The thick mucoperiosteum is grasped and retracted from the bulla, curettes, mosquito hemostats, fine forceps and a fine surgical spatula used to remove the entire mucoperiosteum and ossicles with careful attention to the craniomedial aspect of the bulla, as this houses the round window. The mucoperiosteum was removed in 3 large pieces and smaller samples until the bulla was clean
- 12) flush the bulla, with copious amounts of warm 0.9% saline, suction, and final inspection
- 13) placement of 1/4" penrose drain into bulla
- 14) close in 4 layers 3-0 PDS SC
  - 1) s- digastricus muscle
  - 2) connective tissue
  - 3) s-platysma muscle
  - 4) subcuticular
  - 5) two ties of the penrose drain to skin with long tags, cranial and caudal
  - 6) surgical adhesive

**Recovery:**

extubated in surgery, moved to recovery.  
 pulled dorsal sinus and arterial lines  
 once awake moved into carrier and transported back to NMLC

Dry-holding for three days.

Post Op:

Buprenex 0.5cc IM BID 3 days  
 Meloxicam 0.7 cc IM SID 3 days  
 Enrofloxacin 68mg 1 1/2 PO BID 5 days  
 (7 day total course)

Plan: pull drain in 3 days, allow 48 hours for skin to heal, allow access to full pool.

**Pending Samples:**

Mycoplasma culture to IDEXX  
 Aerobic bacterial culture to IDEXX  
 Anerobic bacterial culture to IDEXX  
 Fungal culture to IDEXX  
 Histopathology to Northwest Zoo Path  
 frozen mucoperiosteum for possible viral studies



**In the meantime . . .**

Hotlips had healed up to the point of allowing her a pool, and since Townsend needed her dry holding and she wanted his pool a swap was arranged during the procedure.

Hotlips took the pool like a pig in mud (wait, that can't be the right saying), she showed no evidence of leaking water from her damaged nostrils, swam and ate underwater, and then hauled out. She will be on Clavamox [13 mg/kg PO BID 7 days], and then we'll assess her wounds and readiness for release, and please monitor for any even hint of an aural discharge from the right side in this one admission



and today



With turtles coming on the horizon, we'll introduce Hotlips and Townsend who can share the large pool, if all continues to go well, and the ventral incision heals up to a water tight seal (I thought all seals were water tight, . . .sorry), in about 1 week. Then we will repeat a skull CT in 2-3 weeks for evaluation of the tympanic membrane and the healing of the tympanic bulla, an intact ear drum may not be a requirement for release, as there is another cartilage and skin "valve" at the external auditory meatus, but we need to have an animal free of active disease and prevent the progression to osteomyelitis, as this is the real aim of the surgery. We will also have a BEAR hearing evaluation done as part of the release assessment. Without the ossicles on the left side there will be healing impairment on the left, but I doubt the seal will be totally deaf (i.e. allowance of conductive sound transmission) and we need to be sure the right side is unaffected.

*C. Rogers Williams VMD*

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