

Rounds  **NATIONAL MARINE LIFE CENTER** **Notes**
 Animal Health Department Veterinary Research Department
 Medical Rounds Under the microscope
"medicine for all" *Caring for Stranded Marine Animals* rwilliams@nmic.org

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.

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Headlines News: Second Surgery Successful, So Far, So Good
special thanks the specialists for special care and skill
Total Ear Canal Ablation (TECA) with Lateral Bulla Osteotomy (LBO)



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 again! The NMLC team of myself, and Kate Shaffer got the seal in and out in 3 hours, surgery was 90 min., anesthesia 2 hours. Nice work all, thanks again-Rogers

TECA w/ LBO:

AM PE: BAR, NPO overnight, HR 120 sinus arrhythmia, RR= 10 apneustic, induced LEFT aural d/c, BS=4/5, other PE WNL, PreOp CBC/CP WNL A: OK for general anesthesia and surgery. Weight 38.7kg.

Anesthesia

PreOp (Williams) 8:45 am @ NMLC

midazolam 1cc (code M7) IM

glycopyrrolate 3cc IM

buprex 2 cc (code B12) IM

transport to CCVS in crate (Shaffer)

induction 9:16 am @ CCVS

HR= 120 bpm, lungs clear

12 cc propofol slow IV dorsal sinus via 2" 18g catheter (Williams)

intubated # ___ first attempt (Trina), PPV 8-16 bpm to 20-25 cc H₂O

maintenance fluids, LRS CRI @ 400 ml/hr IV
total volume 600 ml

Anesthesia was turned over to the CCVS team (Rahilly)

Placed arrow® two port catheter into the dorsal sinus.

Direct arterial line in the medial plexus hind flipper.

Ventilator or PPV by hand, 3L bag

RR 8 bpm, tidal volume 8ml/kg

240 ml minute ventilation of 1.9L

Maintenance __ % sevoflurane in

100% oxygen __ L/min

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

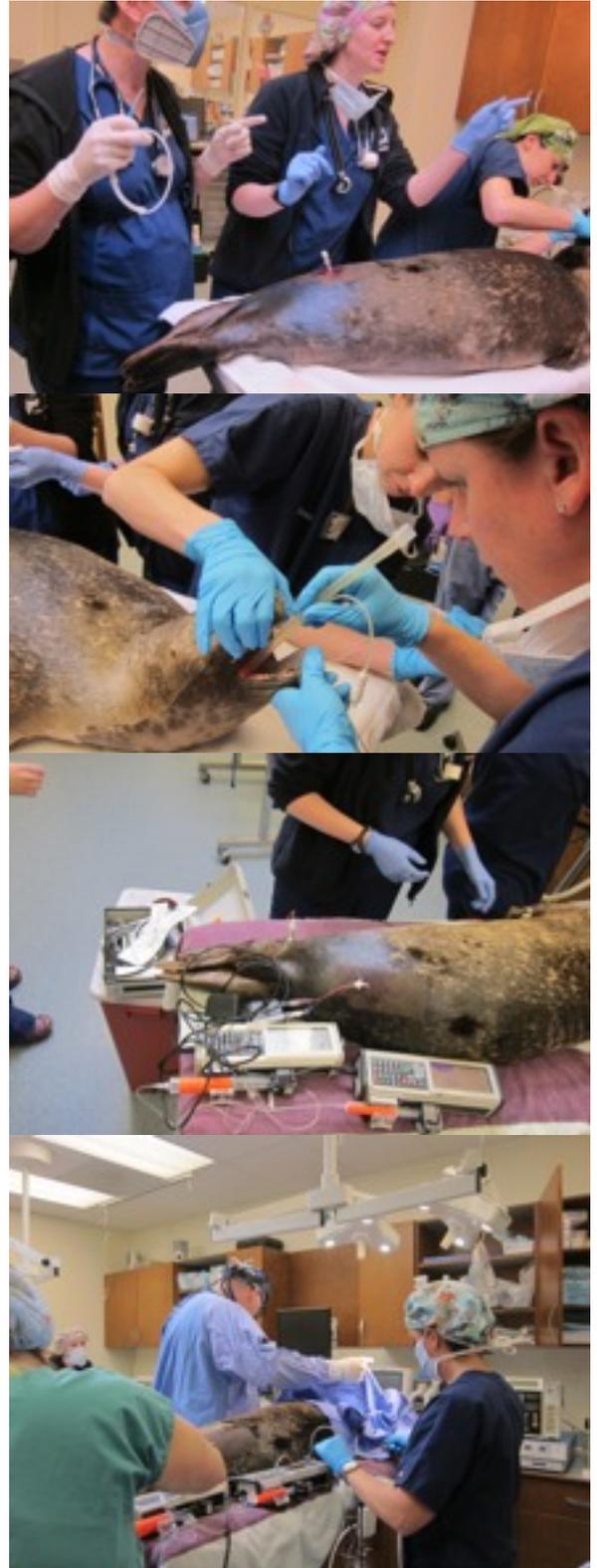
(0.1 mg/kg/hr = 1 ml/hr)

Monitor

1) arterial line placed for iStat CG8 blood gases (X samples) and direct arterial pressure, mean pressure of _____ mmHg was noted.

2) continuous ECG, SaO₂, etCO₂, temp, NIBP (part of the time) [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.

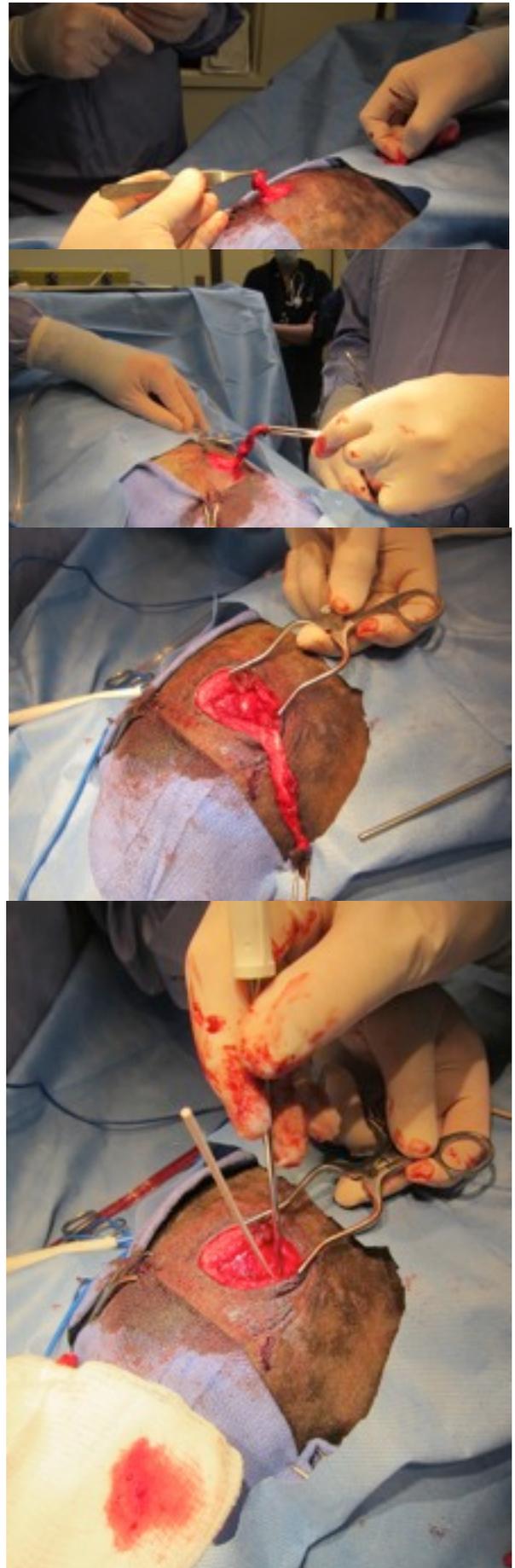


Surgery (Kochin with Williams assistance)

10-11:30 am

Left sided TECA with LBO.

- 1) Elliptical incision around the external auditory meatus directly caudally to account for the anatomy of seals.
- 2) Sharp dissection and electro-cautery to control minor hemorrhage in the skin and blubber layer to the cartilage of the external ear canal.
- 3) Dissection along the external ear canal not straying from the connective tissue attached to the canal. The ventral canal has incomplete cartilage or is very thin and a minor breach of the external canal was made. The cartilage dorsally is more substantial and thus easier to dissect against. Sharp point iris scissors were used.
- 4) Small Weitlander retractors were carefully placed and maintained with caudal traction to follow the canal.
- 5) The canal was dissected deep (>4 cm), eventually held with Alice Forceps to assist manipulation, Minor vessels and muscle tissue supplying the canal were identified and removed. Electocautery was used, one minor vessel was ligated with 4-0 PDS.
- 6) Digital palpation and sterile Q-tips were used to determine the distance to the skull and orient the canal.
- 7) Once the canal was dissected to the level of the ossious auditory meatus (OAM), it was excised. As soon as the external ear canal was opened at the level of the skull, a 1cm x 0.5 cm fleshy polyp popped free. This tissue was removed, sectioned, cultured and sent for histopathology.
- 8) The lateral bulla wall is directed ventrally and caudally and was exposed with a small periosteal elevator.
- 9) Rongures were used to chip away at the lateral wall and protuberance defining the OAM, shards of the bone were removed. The facial nerve, along the caudal boarder, was briefly exposed and protected.
- 10) Meyerding retractor (aka Rogers seal retractor) was used to expose the lateral bulla wall and allow safe use of a nitrogen powered surgical burr to remove the very dense lateral prominace of the latteral bulla wall. Suction was used to clear the field for the osteotomy
- 11) Dark bone fragments were removed from the ventral aspect of the bulla.
- 12) Once the bulla was carefully exposed, sterile Q-tips were used to mark the location of the OAM, care was taken as the medial wall of the bulla contains the canal



of the internal carotid artery.

13) Flush the bulla, with copious amounts of warm 0.9% saline, suction, and final inspection.

14) close in 3 layers 3-0 PDS SC

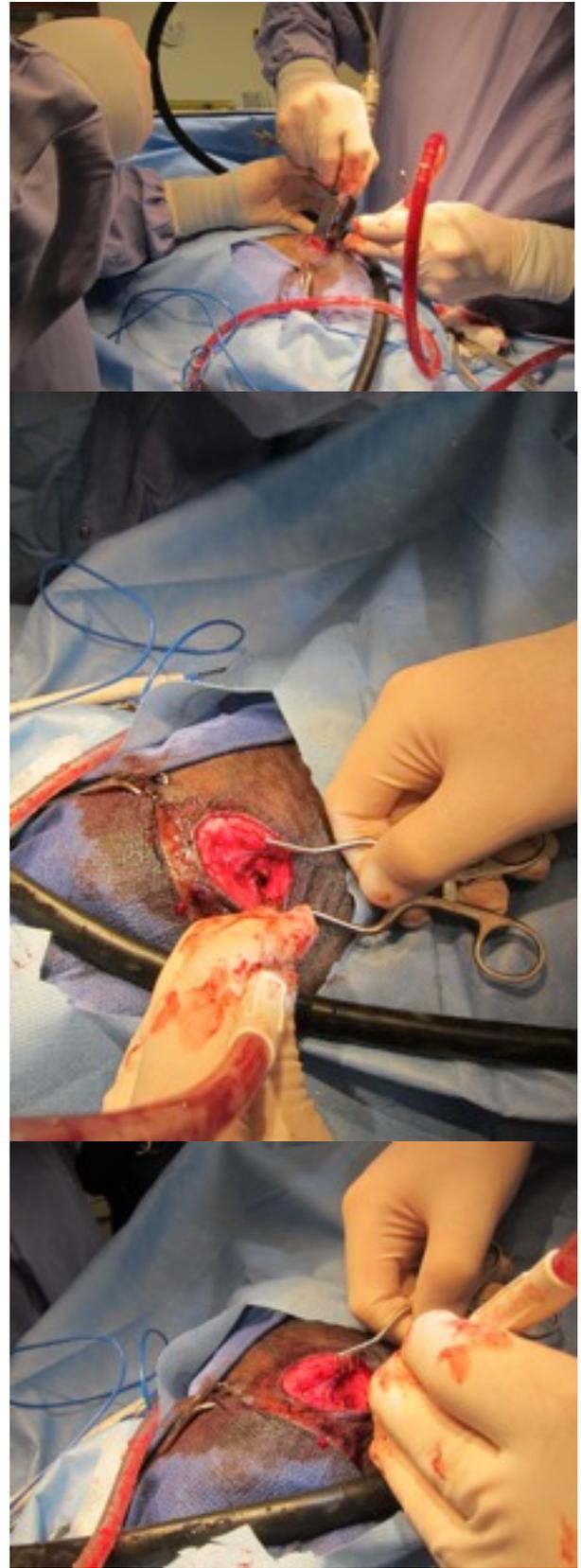
- 1) deep connective tissue
- 2) subcutaneous tissues
- 3) subcuticular
- 4) surgical adhesive

Surgical Notes: The skin incision is stretched caudally as the surgery progresses. The external ear canal is long, curved, and thin and travels in a sinous direction caudally and ventrally from the opening at the skin. The opening of OAM is directly cranial-dorsal with a thick protuberance, but the lateral wall must be followed caudal-ventrally. A thin periosteal elevator was used to expose the lateral bulla wall and assure which tissue and when osteotomy can be performed. Initially a combination of single and double action rongues and a psitol grip rongue were used to break down the lateral bulla wall, but a surgical burr was helpful. Having a seal skull for intraoperative referrance to anatomy and current CT images with 3-D reconstructions of the patient are helpful for both surgical planing and in excution of the plan.

The two most significant findings in this case during the second surgery were the presence of a middle ear polyp that extended through the tympanic membrane and into the distal external ear canal, and the two fragments of dark colored bone which appear to be sequestra.

Recovery:

Recovery was prolonged, likely due to the length of the anesthesia. EtCO₂ was allowed to increase into the 70's to see if this stimulated spontaneous respirations and recovery, but we continued with intermittent PPV with an Ambu bag and room air with a CO₂ and pulse oximeter monitor. Due to a decrease in the heart rate, 1cc (0.5 mg/ml) of atropine was given IV during recovery. The midazolam was reversed twice with flumazenil 0.01 mg/kg, first dose split 50% IV, 50% IM, the second dose was given approximately 10 minuets later IV. Movement to sternal and external stimulus also hastened recovery. IV lines were pulled and the seal was assisted back into a kennel for transport back to



NMLC. No loss of blink reflex was observed, nor nystagmus nor a head tilt. The seal was sleeping hours after the procedure and will be held in dry holding for at least three days.

Post Op Plan:

- Buprenx 0.5-1 cc IM BID 3 days
- Meloxicam 0.7 cc IM SID 3 days
- Naxcel® ceftizfur 1 cc IM SID 5 days
(pending culture results)

Pending Samples:

- Mycoplasma culture to IDEXX
- Aerobic bacterial culture to IDEXX
- Histopathology to Northwest Zoo Path (external ear canal, polyp, bone)

C Rogers Williams VMD

Sea Rogers Williams VMD
attending veterinarian and director of science



[STAFF: Kathy Zagzebski, Kate Shaffer, Adele Raphael, Belinda Rubinstein]

