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Snout deviation and eye protrusion in a male rat

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A group of male Wistar rats was obtained from an animal colony of the school of medicine of University of Veracruz for studies of sexual behavior. When they arrived at our local animal facility, the males were about 1 month old and were housed in groups of five individuals in large plexiglass cages with free access to laboratory rat pelleted food and water. The animal room was maintained at approximately 23 ± 2°C with 30–80% humidity on a reverse 12-h:12-h light:dark cycle.

The study for which the rats were being used required them to be 'sexual experts'. Thus, at the age of two months, they were exposed to sexually receptive females for copulation. After a few sessions, the experimenters realized that the snout of one male was deviated towards the left and that his right eye was larger than his left. The researchers then sought veterinary assistance.

Upon general examination, we noticed a healthy-looking coat. The rat's body temperature was 37.3 °C (in the normal range of 36–37.5 °C; ref. 1) and there were no signs of respiratory, cardiac or digestive problems. There was no weakness of any limb, and the rat showed normal gait, postural reactions, hopping responses and muscle size. The rat's food and water consumption could not be calculated, but it showed no signs of starvation or dehydration. Examination of the head showed an enlarged right eye and severe deviation of the snout towards the left (**Fig. 1a**,**b**). Inspection of the mouth showed that the upper incisive teeth were also twisted towards the left but were of normal length (**Fig.1c**). No discharges were observed from the nose or mouth, and palpation did not evoke any pain reaction. The neurological examination indicated a reduced menace response on the right side. The right pupil was dilated and did not respond to light; however, the pupillary eye reflex could not be assessed properly because the rat was albino. There was no strabismus or abnormal nystagmus. Nociceptive reactions evoked with a small needle were reduced on the right side of the face. The palpebral reflex was also slower. The rat reacted when exposed to new food odors, but vibrissae movement on the right side was impaired. Masticatory muscles on both sides were of similar size, with apparently normal tone jaw-closure. The tongue was of normal size, and it retracted when pulled out.

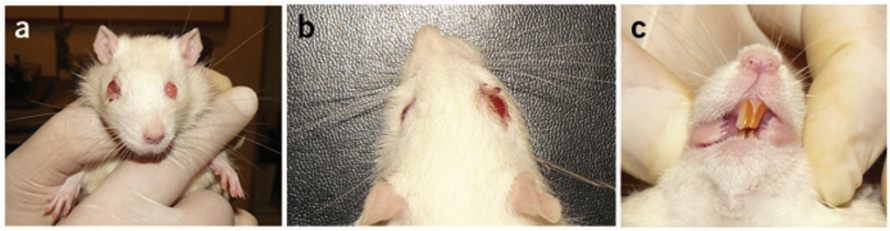

FIGURE 1 | A 2-month-old male rat with snout deviation towards the left and eye protrusion on the right side. (**a**) Frontal view. (**b**) Dorsal view. (**c**) Incisor teeth are twisted towards the left.

We anesthetized the rat with a solution (50 mg/ml) of pentobarbital (administered at 35 mg per kg body weight intraperitoneally). Once the rat was completely relaxed, we assessed the face again and noticed that the snout deviation was the same, with no improvement following muscle relaxation. Inspection of the mouth did not show any abnormal mass. The researchers elected to euthanize the rat, and we gave an overdose of pentobarbital (100 mg per kg body weight administered intraperitoneally) and carried out a necropsy.

The abdominal and thoracic organs appeared normal in size and position. The brain looked normal, and the cranial nerves were symmetric with no sign of abnormal compression or hemorrhage at their origin in the brainstem. Further examination of the skull showed bone deformation, explicitly of the maxillary complex. The nasal bones were deviated to the left. The right infraorbital fissure, right maxillary bone, lacrimal bone, malar process and zygomatic bone were enlarged and thickened (**Fig. 2**), but were also porous and soft. There were no gross signs of bone inflammation, and a transverse cut of the nasal bones showed that the nasal cavity was free of discharge.

Considering the rat's clinical signs and necropsy findings, what do you think is the clinical problem? Would you request additional diagnostic tests?

What's your diagnosis?

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