

Short communication

A note on malocclusion in young Wistar rats



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Abstract

Five cases of malocclusion were reported in 3-5 months old Wistar rats (male – 3, female - 2). Clinical history indicated that though these animals were maintained under standard laboratory/husbandry practices, since a month were anorectic, losing weight and became lethargic/dull. Careful examination of buccal cavity showed increased length of lower / upper incisor teeth (1.5-2.5 cm) protruding outside the mouth and mild to moderate degree of congestion and erosions on buccal mucosa. Possible etiology could not be ascertained in these cases but younger age of the rats was suggestive of its congenital origin as against spontaneous.

Key words: Congenital, malocclusion, Wistar rat

Misalignment of jaws is known as malocclusion and prognathism (pro = forward, gnathos = jaw) means abnormal projection of one or both the jaws (Kuijpers, 1996, Sharp and LaRegina, 1998). Malocclusion has been categorized under three heads viz., class I – the most common type and the upper teeth slightly overlap the lower ones but the “bite” is normal, class II – the upper jaw and teeth overlap the lower jaw and teeth but the “bite” is not normal and class III- the lower jaw protrude forward causing the lower jaw and teeth to overlap the upper jaw and teeth with abnormal “bite”. Optimum occlusion of incisors is essential for maintaining a balance between their rapid growth and normal attrition of teeth. It has been reported in a number of laboratory animals viz., rabbit, Guinea pig, rat, mouse, hamster and gerbil (Percy and Barthold, 2007). The present communiqué reports five cases of malocclusion in young Wistar rats of either sex. The rats were maintained in air conditioned rooms. Polypropylene rat cages covered with stainless steel grid top were used to house the rats. Each cage was fitted with a polypropylene water bottle with a stainless steel nozzle. Autoclaved clean rice husk was used as bedding

material which was routinely changed on every second day. The animal rooms were cleaned and the floor was mopped with disinfectant solution daily. Feed manufactured by M/s Harlan, The Netherland (Teklad Certified Global high fibre) for rats were provided *ad. lib*. The quality of feed was checked and monitored regularly. Aquaguard filtered water was also provided *ad. lib*. Temperature of the room ranged between 19-23°C with relative humidity 64-65%, photo period 12 hrs light (6.00 A.M. – 6.00 P.M.) and 12 hrs dark (6.00 P.M.-6.00 A.M.) and minimum 15 air changes/hour.

Malocclusion was observed in five young 3-5 months old Wistar rats (male - 3, female- 2). Clinical history indicated that these animals were maintained under standard laboratory/husbandry practices. Since a month these were anorectic, losing weight and became lethargic/dull. In addition, an increase in the length of incisor teeth (both lower and upper jaws) was noted. These animals were euthanised using carbon dioxide and necropsies were conducted. Examination of buccal cavity showed overgrown incisors (upper and lower),

mild to moderate congestion and varying degree of erosions on buccal mucosa. It has been reported that, overgrown teeth are reported to damage soft tissue of mouth like cheek, tongue or palate (Dontas *et al.*, 2010). The length of affected incisors measured 1.5 to 2.5 cm among different rats as against 0.8 to 1.2 cm in normal rats of comparable age group. The affected teeth when smaller in size somehow accommodated within buccal cavity but bigger ones protruded outside the buccal cavity (Fig 1, 2). The gross findings supported the observations of earlier workers in rats (Dontas *et al.*, 2010), rabbits (Gupta, 2003, Kadam *et al.*, 2003) and Guinea pigs (Rest *et al.*, 1982).

In the present study the rats were quite young (3-5 month old) and the rate of occurrence in either sex was almost comparable (male = 3, female = 2). However, Dontas *et al.* (2010) reported that the rate of occurrence is comparatively lower in females (0.3%) than males (1.0%). They further mentioned that malocclusion does not develop up to the age of one year, but by the age of 3 yrs about 32% rats (13/40) develop this ailment. The incisor teeth of rodents are open-rooted i.e. continuously grow throughout their life and are renewed every 40-50 days (Kuijper *et al.*, 1996). To maintain proper balance between their growth and normal dental attrition, optimum occlusion of incisors is necessary. This imbalance between the growth and attrition causes malocclusion resulting in difficult feeding leading to malnutrition and even death in extreme cases. Etiology could be hereditary or functional misalignment or mechanical trauma or soft diet or insufficient dietary intake of minerals (magnesium) or hypovitaminosis A, D, E or infection of tooth root/pulp secondary to tooth fracture or neoplasia of jaws or a combination of these (Sharp and LaRegina, 1990, Harkness, 1994, Wilson-Sander, 2002, Dontas *et al.* 2010). Possible etiology could not be ascertained in the present report, but younger age of rats was suggestive of congenital origin as against spontaneous (Percy and Barthold, 2007). If genetic cause is established, to keep the herd free from this inherited problem, the parents and their off springs should be euthanized.

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Fig 1. Malocclusion: Overgrowth of both lower and upper incisors



Fig 2. Malocclusion: Protrusion of lower incisors outside buccal cavity

