CASE REPORT

Bilateral Rostral Mandibulectomy for the Management of Oral Tumor in Dogs: A Report of Two Cases

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Neoplasia in the oral cavity is the fourth most common site, accounting for about 5% of all malignant tumors detected in dogs and 7% in cats (Fossum *et al.,* 2002). Bilateral rostral mandibulectomy involves the excision of a portion of the rostral aspect of both mandibles (Lantz 2012). The primary reason for performing a bilateral rostral mandibulectomy in dogs is to surgically remove benign or malignant oral tumors that extend across the midline rostral to the mandibular first premolar teeth (Smithson and Taney 2009). Although bilateral rostral mandibulectomy leads to mandibular prognathism, the cosmetic result and prehension and mastication functions are generally excellent (Salisbury 2003). This document presents a successful bilateral rostral mandibulectomy in two dogs with oral tumors without mandibular fixation and with cosmetic reconstruction of the lower lip without tension.

Case History and Clinical Observations

Two dogs (Kanni, 6 years male weighing 21 kg and Golden Retriever, 8 years female weighing 25 kg) were presented with the history of reddish growth on rostral aspect of mandible to Small Animal Clinics, Orthopedic Surgery Unit of Madras Veterinary College Teaching Hospital, Chennai.

In Golden Retriever dog (case I), growth exhibiting increasing tendency was noted over a period of nine months. Physical examination revealed single reddish, cauliflower like tumor mass involving left rostro-ventral aspect of canine and incisors teeth and gingival crossing the symphysis (Fig. 1).

In Kanni dog (case II), tumor involving the rostral mandible since six months exhibiting an increasing tendency of growth size and bleeding while prehension was reported. Physical examination revealed single multi-nodular, ulcerated reddish outgrowth around the left canine tooth involving gingiva, and incisor teeth in rostral mandible extending the symphyses (Fig. 2).

General and complete blood profile revealed all the parameters within the normal limits in both the cases. Thoracic radiographs revealed no signs of metastases. Both the cases were planned for bilateral rostral mandibulectomy.

Treatment and Discussion

The animals were kept fasted for 6 h and 12 h for liquid and solid food, respectively. Pre-emptive antibiotic with Inj. Cefotaxim @ 20 mg/kg b wt. i/v was administered and general anaesthesia was carried out by premedication with Inj. Butorphanol @ 0.2 mg/kg b wt. i/v and Diazepam @ 0.25 mg/kg b wt. i/v, induction with Inj. Propofol @ 4 mg/kg b wt. i/v and maintenance with 1.5% Isoflurane in 100% oxygen in both the cases. 0.1% solution of chlorhexidine gluconate was utilized to rinse the oral cavity. In order to prevent the accumulation, passage of fluid and organic material in to thoracic cavity, gauze was placed in the pharynx and around the endotracheal tube. The animals were positioned in dorsal recumbency with their mouths opened wide. Gingival mucosa was incised towards the oral cavity at 1-2 cm distance from the normal tissue on all boarders of rostral mandible by giving wide margins. Using periosteal elevator, the gingival mucosa was undermined and reflected to expose the lateral and ventral aspects of the ramus (Fig. 3). With the help of oscillating saw osteotomy was made between the first and second premolars in case I, and canine and first premolar teeth in case II, bilaterally preserving some extent of symphysis with sterile saline dripping over the blade to avoid overheating and subsequent thermal necrosis of bone (Fig. 4). Bleeding from the mandible was controlled by packing the canal with bone wax. No fixation technique was used to stabilize mandible. Rudimentary skin was incised in V-shape bilaterally for cosmetic appearance and the lower lip was reconstructed (cheiloplasty) and surgically closed using

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Fig. 1: Single reddish, cauliflower like tumor mass involving left rostral ventral aspect of canine, incisors teeth and gingiva

Fig. 2: Single multi nodular, ulcerated reddish outgrowth around the left canine tooth involving gingiva, and incisor teeth.

monofilament, polyamide 3-0 suture in a simple interrupted pattern without any tension to minimize the risk of wound dehiscence (Fig 5, 6). The resected mass was submitted for histopathology which revealed squamous cell carcinoma in case I (Fig. 7) and aeloblastoma in case II (Fig. 8).

One day prior to surgery, Fentanyl patch was applied in both the cases, oral antibiotic tab Amoxy-Clav @ 375 mg/kg b wt. was advised BID for four days, and Elizabethan collar round the clock until suture removal. Liquid diet was recommended for three days followed by soft diet for three weeks post-operatively. Both the animals made an uneventful recovery after surgery with no signs of regrowth and metastases in three years follow up period.

Bilateral rostral mandibulectomy resulted in mild degree of prognathism but both dogs adopted well for prehension within a week. Reconstruction of the lower lip was performed by apposing labial mucosa with mucoperiosteum. In both the cases caudal aspect of symphysis was spared, so preventing from implant fixation and its complications. Bilateral rostral mandibulectomy can be conducted as a symphyseal-sparing rostral mandibulectomy, especially when the tumor is situated around the mandibular incisors or canine teeth, and a tumor-free margin of 1 to 2 cm can be achieved (Domnick and smith, 2015). The tumors located in the rostral position carry more favorable prognosis than tumors located in the caudal maxilla and mandible (Shafiuzama *et al*., 2016).

Fig. 3: Seperation of lower lip from rostral mandible

Fig. 4: Bilateral rostarl mandibulectomy between canine and first premolars using oscillating saw

Fig. 5: After reconstruction of lower lip

Fig. 6: Mandible after reconstruction

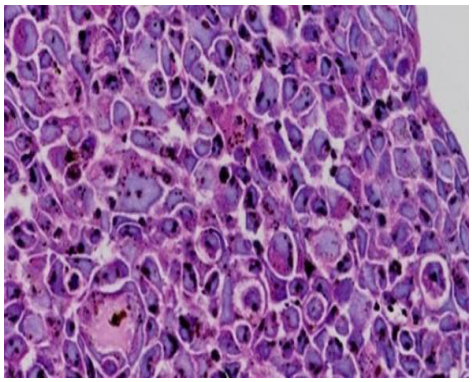

Fig. 7: Nuclei are round to oval with irregular profiles. Moreover, a high nucleus: cytoplasma ratio, thick nuclear membranes and clumped chromatin are often found together with the degree of nuclear pleomorphism and the mitotic rate varied among the sample X 100 indicative of Squamous cell carcinoma.

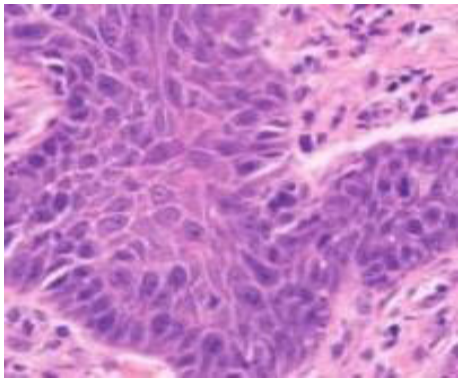

Fig. 8: Neoplastic islands with characteristic outer layer of epithelial cells oriented with their long axes perpendicular to the basement membrane and anti-basilar nuclear polarization X 100 indicative of Acanthomatous ameloblastoma.

Acanthomatous ameloblastomas are tumors that exhibit local aggressiveness but do not metastasize. These fleshy growths are commonly found in the incisor/canine region of large-breed dogs (Taney and Smith, 2010). Squamous cell carcinoma is the common malignant tumor in dogs, locally aggressive but late to metastasize (Dhaliwal, 2010). The practice of utilizing orthopedic implants to stabilize mandibles following a bilateral rostral mandibulectomy has been documented, but it is widely acknowledged as unnecessary and, consequently, seldom practiced (Salisbury, 2003). Prehensile dysfunction and drooping of the tongue may result from bilateral rostral mandibulectomy, if ostectomy is performed caudal to the second premolar bilaterally, leading to insufficient support at the base of the tongue (Shafiuzama *et al*., 2016). Complications noted after mandibulectomy were suture dehiscence, significant oedema, mandibular instability (Tsugawa *et al*., 2022). No post-operative complications were observed in either case.

In general rostral bilateral mandibulectomy aims to alleviate pain, enhance quality of life, and potentially prolong survival in dogs with conditions affecting the rostral aspect of the mandible. Early surgical intervention significantly minimizes the invasiveness of the procedure. Additionally, timely detection and treatment substantially lower the risk of tumor metastasis.

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