MORPHOLOGY OF THE DENTAL ARCADE IN ADULT PIGS (*Sus scrofa domesticus*)

Fernández Sánchez, J.M [1,3] DVM, del Campo Velasco, M [1,3] DVM,
Marín García,P [2] DVM, PhD and San Román Ascaso, F [3] MD DVM DDS PhD DiplEVDS.
1: Veterinary Clinic " Río Duero". Móstoles. Madrid.Spain
2: Morphology and Embriology Department. UCM. Madrid. Spain
3: Animal Pathology II Department of the Veterinary Clinical Hospital. UCM. Madrid. Spain

INTRODUCTION

The study of the dental arcade in adult pigs is very important due to its significance as an experimental animal in human odontology. This is due, among other causes, to the fact that, like humans, it is omnivorous and the premolar and molar teeth show many similar characteristics to human teeth and they suffer from common pathologies like periodontal disease or caries.

The present work stands out because of its originality, since when doing a bibliographic search, we have not found any reference to pig species, where all the anatomical references, morphology, classification, descriptive elements and work model for dental arcades in adult pig are described in such a detailed way.

MATERIAL AND METHODS

In the present work six complete domestic pig crania with mandible were used; three of them corresponding to 3 to 4 year-old boars and three from 7 year-old culling sows.

Upon the heads some references were taken in order to define some topographic planes and establish the concept of dental arcade. The aim was to study on all of them the common characteristics of the teeth, such as dentition, dental anatomy, occlusion, number and dental formula, teeth nomenclature and teeth replacement.

Skull of a pig (female). Dorsal view

Dorsal view of mandibular bone

Ventral view of the rostral maxillary bone

Lateral view of the rostral mandibular bone

RESULTS

For the study of the dental arcades some vertical (frontal and sagittal) and horizontal (Camper's line and occlusal) reference planes were established on the pigs heads (taken as reference the anatomical planes studied in the human head, Cretot, M., L'Arcade dentaire humaine, morphologie).

The occlusal plane defines the upper dental arcade or maxilla and the lower arcade or mandible.

Pig teeth, as well as human teeth, have crown, neck, root and pulp cavity and radicular alveoli.

Pigs, as the rest of domestic mammals, have two dentures or dentitions:

** The primary, deciduous, temporary or milk dentition. Formed by 32 teeth, and which dental formula is 2(Di 3/3 Dc 1/1 Dp 4/4).

** The secondary, permanent, definitive or substitute dentition. Formed by 44 teeth, and which dental formula is 2(I3/3 C1/1 P4/4 M3/3).

Due to this, they are called diphyodont. Pigs are born with eight teeth: the deciduous upper third incisors (503, 603, 703, 803) and the canines (504, 604, 704, 804). These teeth project almost literally from the gums and may injure the teat of the sow or the littermates. For this reason they are usually nipped off within the first 2-6 hours of birth (canine clipping).

Pig has four types of teeth: incisors, canines, premolars and molars.

Pigs, being omnivorous, have simple incisors (haplodont) and tuberculate premolar and molar teeth (bunodont). Their teeth, with the exception of the canines, are brachydont (Gr., low crown: to this group belong the teeth of pigs, dogs and humans) and consist of a recognizable crown, which is projected into the mouth, a root, the embedded portion in the dental alveolus and a slightly constricted neck between the crown and the root, to where the gums are fixed.

The canine teeth are hypsodont (Gr., high crown, like the horse teeth), more specialized than the brachydont teeth. The crown and the neck are not easily distinguished and there is only a body and a root. The body has a free portion, which is surrounded at its base by the gums and an embedded portion, which is usually long in the young animal.

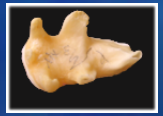
The wide crowns in premolar and molar teeth suppose an intricate unit of rounded tubercles, which make of them ideal instruments for crushing the food; this kind of teeth are called bunodont (Gr., small mound).

Vestibular area 201, 202 and 203

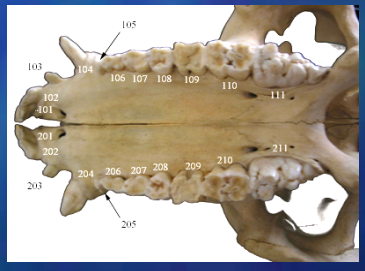
Vestibular area 306

Occlusal area 211

Vestibular area 211



Apical area 211



Ventral view of the maxillary bone with occlusal surfaces

Occlusal surface of premolars and molars of the right mandibular bone

CONCLUSIONS

The conclusions that justify the use of pigs in human odontology are varied, since the pig complies with many of the characteristics of the ideal animal in dental research, such as:

1. Growth rate similar to humans and useful for analytical and experimental studies.
2. Physiology similar to humans: mastication, mandible movements, adaptability to environmental changes and resistance to endemic diseases.

Suitable size of teeth and mandible to allow dental operations and growth measurements; easy access to teeth and oral glands and low cost.