

دراسات تشريحية على المدد العصبى فى معدة الجاموس

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قام الباحثان بدراسة تشريحية عن مسار وتوزيع العصب الحائر فى معدة الجاموس . وقد تمت هذه الدراسة على عشرة معدت جاموسى . خمس أجنة كاملة النمو ، أربع عجول جاموسى ، أربع حيوانات كبيرة تم جمعهم من مجازر القاهرة والهجرة وقسم الجراحة بالكلية .

وقد تمت مراجعة البحوث التى أجريت على المدد العصبى للحيوانات المستأنسة حتى يمكن مقارنة النتائج التى تم استخلاصها مع ما سبق وصفه من الباحثين فى هذا المضمار وقد قصر الشرح على مسار وتوزيع العصب الحائر (الجزعين المريئين الظهرى والبطنى) وذلك لان الامكانيات المتاحة لا تتيح فحص المدد الودى نظرا لانه يكون جزوعا عصبية دقيقة ترافق الأوعية الدموية وفيما يلى عرض للنتائج التى توصل اليها الباحثان .

أولا :

الجزع المريئى الظهرى :

وينقسم الى فرعين داخل البطن هما الفرعان الظهرى والبطنى .

(أ) الفرع الظهرى . تخرج منه الفروع الآتية:

- ١ - خيوط (ليبيقات) تغذى منطقة البهواكرشى .
- ٢ - فرع يسير فى الميزاب الكرشى القحافى حتى ينتهى بفروع دقيقة تغذى الأجزاء المجاورة للميزاب القحافى .
- ٣ - فروع تغذى الميزاب المعدى .
- ٤ - العصب الكرشى الأيسر .
- ٥ - العصب الكرشى الأيمن .

(ب) الفرع البطنى وتخرج منه الفروع الآتية :

- ١ - فروع شبكية ذيلية (خلفية) .
- ٢ - فروع دقيقة تتصل بالعصب الودى والجزع المريئى البطنى .
- ٣ - فروع ورقية (٣-٤) تغذى الورقية .
- ٤ - فروع يعطى فروع الانحناء الأكبر للانفحة ويعطيان فروعاً أنفحية حشوية .

ثانيا :

الجزع المريئى البطنى : يعطى الفروع الآتية :

- ١ - العصب البوابى الطويل .
- ٢ - فروع أنفحية جدارية .
- ٣ - فروع شبكية قحافية (أمامية) تغذى الشبكية وكذا البهواكرشى .
- ٤ - خيوط رفيعة للورقية الشبكية .

SOME ANATOMICAL STUDIES ON THE INNERVATION OF THE STOMACH OF BUFFALO IN EGYPT (*BOS, bubalis, L.*).

(with 2 figures)

By

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SUMMARY

The course and distribution of the two vagi are described in the stomach of buffalo. After reviewing the available literatures the obtained results are compared with those reported in other ruminants. Meagre difference are recorded between the buffalo and the ox.

The dorsal oesophageal nerve trunk gives :

A-A Dorsal branch which supplies :

1. Filaments to the atrium ruminis (Rami atriales rumines),
2. Branch to the cranial groove (Ramus ad sulcum cranialem),
3. Branches to gastric groove (Rami ad sulcum ventriculi),
4. Left ruminal nerve (Ramus ruminalis sinister),
5. Right ruminal nerve (Ramus ruminalis dexter),

B-A Ventra branch which supplies :

1. Rami reticulares caudales, 2-Anastomatic filaments to join the sympathetic and others to the ventral oesophageal nerve trunk,
3. Rami omasales, 3 to 4 branches to the omasum,
4. Ramus ad curvaturam maiorem abomasi which gives Rami abomasiales viscerales.

The ventral oesophageal nerve trunk gives :

1. A long pyloric nerve (Ramus pyloricus),
2. Rami abomasiales parietales.
3. Cranial reticular branch (Rami reticulares craniales) which, gives branches to atrium ruminis (Rami atriales ruminis),
4. Smaller filament to the omasum (Rami omasiales) and the reticulum.

INTRODUCTION

The nerve supply of the stomach in animals was described by several workers. CHAUVEAU and ARLOING (1891) described the gastric vagi in sheep. FOUST (1929) gave a detailed description of the bovine gastric innervation, as it could be demonstrated by dissection. HÖFLUND (1940) described the main gastric branches that he considered to be constant in the ox, sheep and goat. PHILLIPSON (1946) compared the innervation of the ruminant and the simple stomach. This comparison was based on the homology of the compartments of the ruminants stomach with parts of the simple stomach given by PERNKOPF (1931).

HABEL (1956) had tenuously studied the innervation of the ruminant stomach by using one cow, two sheep and a goat. Moreover, he stained an alamb and a kid supravitaly with 0.02% methylene blue and 0.00015% Mn Cl₂ in 0.85% Na Cl solution, according to WOROBIEW (1925).

HABEL (1956) found that the dorsal and ventral trunks take a parallel course from the cardia to the reticulo-omasal junction, over the omasum, and along the lesser curvature of the abomasum to the pylorus. The ventral part of the left lip of the oesophageal groove and the parietal side of the reticulo-omasal junction receive twigs from the ventral trunk; however, the right lip of the same groove and the visceral side of the latter junction receive twigs from the dorsal trunk. The cranial surface of the reticulum is innervated by the ventral trunk, and the opposite surface by the dorsal trunk. While the rumen is almost entirely innervated by the dorsal trunk. Most of the wall of the omasum is innervated by the dorsal trunk, the branches of the ventral trunk being restricted to the ventral parietal surface. The visceral and parietal surfaces of the abomasum are innervated by dorsal and ventral trunks respectively. Grossly, the pylorus receive vagal innervation from three sources : the termination of both trunks and the long pyloric nerve.

TAYEB (1957). DELLMAN, FAHMY & HELMY (1965) described the vagi in the camel.

MOUSTAFA & FAHMY (1968), and PRAKASH, TEWARI, & SHARM (1968) described briefly the dorsal and ventral oesophageal trunks in buffalo. They found that dorsal oesophageal trunk is distributed on the right side of the dorsal and ventral ruminal sac ; while the ventral oesophageal trunk supplies the omasum, caudal and ventral surfaces of the reticulum, abomasum and portal area of the liver.

In the present work, the innervation of the stomach, by the vagus, has attracted our attention as an important subject to study in the buffalo.

MATERIALS AND METHODS

A total of 5 foetuses 9-10 months ; 4 calves 1-4 months and 4 adult buffaloes (3-8 years) were obtained from the Pathology and Surgery Departments, Faculty of Veterinary Medicine, Cairo University. Besides 5 isolated stomachs of calves (2-4 months and 5 of adult buffaloes were collected from the public slaughter house at Cairo and Giza. The specimens were fixed in formalin saline. The isolated stomachs were injected with Kellners mass through the major branches of the coeliac trunk. They are filled with straw to facilitate the dissection and then immersed in a formaline glycerine solution for 24 hours before dissection.

The distribution of the vagi to the different compartments of the stomach were demonstrated by dissection and the fine branches were followed as possible by the unaided eye. The procedure mentioned by HABEL (1956) for the supravital staining nerves was tried but no satisfactory results were observed. The terminology used in this work was that of Nomina Anatomica Veterinaria (1973).

RESULTS AND DISCUSSION

The basic autonomic innervation of the stomach in domestic animals, as the rule in most visceral or involuntary organs or structures, is carried out through two pathways : namely the cranio-sacral (Parasympathetic) and the thoraco-lumbar (sympathetic). This work is concerned with the study of the vagus of the cranio-sacral division.

The right and left vagi proceed on either side of the thoracic part of the oesophagus, each gives the recurrent nerve, and then divides into dorsal and ventral branches of both vagus unite on a level with the 9th. thoracic vertebra to form the dorsal oesophageal trunk. Similarly, the ventral branches unite to form the ventral oesophageal trunk at the level of the 5th. thoracic vertebra or immediately caudal to the tracheal bifurcation. The two trunks proceed caudally in the post-cardial mediastinum to pass through the hiatus oesophagicus.

The Dorsal Oesophageal Trunk (Truncus oesophageus dorsalis)

S. Dorsal Vagal Trunk (Truncus vagalis dorsalis) : The dorsal vagal trunk extends on the right face of the abdominal part of the oesophagus and divides at the cardia into dorsal and ventral branches.

The Dorsal Branch (Fig. 1)

The larger and thicker dorsal branch, divides in reaching the right face of the atrium ventriculi and the proximal part of the cranial dorsal ruminal sac, into left ruminal nerve (branch) (Fig. 1/1) and right ruminal nerve (branch) (Fig. 1/2). A number of filaments are given to the atrium ruminis (Rami atriales ruminis), the cranial groove (Ramus sulcum cranialem), and the gastric groove (Rami ad sulcum ventriculi).

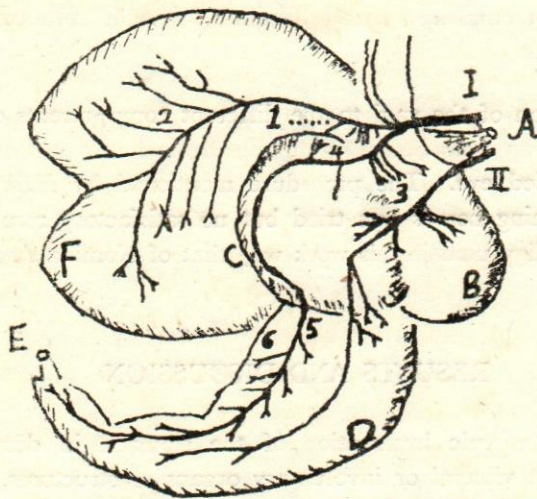


Fig. 1. Right side of buffalo's stomach showing the distribution of vagal trunks (diagrammatic drawing).

A.—Oesophagus

C.—Omasum

E.—Duodenum

1. Ramus ruminis sinister

2. Ramus ruminis dexter

3. Rami reticulares caudales

4. Rami omasiales

5. Ramus ad curvaturam majorem abomasi

6. Rami abomasiales viscerales

I.—Dorsal vagal trunk

II.—Ventral vagal trunk

B.—Reticulum

D.—Abomasum

F.—Rumen

The left ruminal nerve (Ramus ruminis sinister) (Fig. I/1) descends ventrocaudally on the right face of the rumen to the cranial transverse groove, where it divides into a number of branches which accompany the left ruminal artery. The nerve continues its course embedded in the fat of the left longitudinal groove and gives a number of branches for the right and left surfaces of the ruminal wall.

The right ruminal nerve (Ramus ruminis dexter) (Fig. 1/2) may be considered from its size and course as the direct continuation of the parent nerve, it crosses the deep face of the two branches of the omaso-abomasal artery and the left ruminal artery to reach the right longitudinal groove where it accompanies the right ruminal artery. The nerve then turns round the caudal transverse groove to gain the left face of the rumen. Where it divides into two terminal branches and one or two collateral ones. Similar findings were obtained by HABEL (1956) in the ox. However, MOUSTAFA & FAHMY (1968) stated that in the buffalo the dorsal oesophageal trunk gives several branches which form a plexus around the coeliac trunk and its branches; they do not refer to left and right ruminal nerves.

The Ventral Branch

The smaller ventral branch reaches the greater curvature of the omasum (dorsal curvature) by passing along the right face of the atrium ventriculi, and the ventral branch of omaso-abomasal artery. Along its course, the nerve gives a number of filaments some of which join together to form a network distributed to the region of the rumino-reticular junction. Moreover, branches are given to the reticulum, the caudal reticular branches (Rami reticulares caudales) (Fig. I/3). Other branches extend along the right and left faces of the omasum.

Anastomotic filaments join the perivascular sympathetic plexus at the onset of the omaso-abomasal artery. Similar observation was reported by MOUSTAFA & FAHMY (1968) in buffalo, HABEL (1956) and FREWEIN (1962) in the ox. Other filaments go to the ventral oesophageal nerve trunk.

The ventral branch terminates at the omasum in the following branches.

1 — A small branch passes ventrally for a very short distance and divides into 3-4 branches which are distributed to the upper part of the dorsal curvature of the omasum as omasal branches (Rami omasiales) (Fig. I/4).

2 — A much longer branch continues the course of the parent nerve to the great curvature of the abomasum (Ramus ad curvaturam majorem abmasi) (Fig. I/5). Along the visceral surface of the omasum, the nerve passes

in company with the dorsal branch of the omaso-abomasal artery to reach the omaso-abomasal junction. At the lesser curvature of the abomasum, it is insinuated between the two layers of the lesser omentum and supplies the pyloric region and the first part of the duodenum. It gives visceral abomasal branches (Rami abomasiales viscerales) to the abomasum (Fig. I/6). This result is in accordance with HABEL (1956) in the ox. RAGHAVAN (1964) stated that in the ox, the dorsal vagal trunk is distributed to the right face of the rumen and the adjacent part of the abomasum. However, MOUSTAFA & FAHMY (1968) found that the reticulum, omasum and abomasum take their innervation mainly from the ventral vagal trunk.

The Ventral Oesophageal Trunk. (Truncus oesophageus ventralis) §. Ventral Vagal Trunk. (Truncus vagalis ventralis) : The ventral vagal trunk divides at the ventral part of the cardia into the following branches (Fig. I/II & Fig. II).

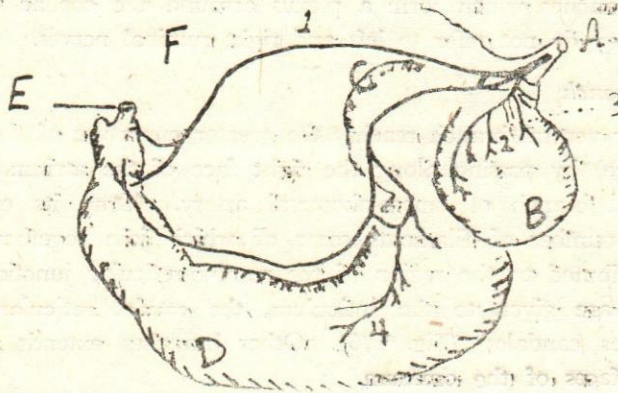


Fig. II.—Ventral oesophageal nerve trunk of buffalo (diagramatic drawing)

A.—Oesophagus

B.—Reticulum

C.—Omasum

D.—Abomasum

E.—Duodenum

F.—Lesser omentum (cut)

1. Ramus pyloricus
2. Rami reticulares craniales
3. Rami atriales ruminis
4. Rami abomasiales parietales.

1 — A long pyloric nerve (branch) (Ramus pyloricus) (Fig. II/1) :

The long pyloric nerve originates prior to the terminal bifurcation of the parent nerve. It passes to the right of the median plane, ascends dorso-caudally on the right upper part of the reticulum embedded in the lesser

omentum and in close contact with the visceral surface of the liver. The nerve continues along the ventral border of the duodenum to reach the pyloric region of the abomasum, where it ramifies. A number of small branches are distributed to the duodenum as well as to the surrounding fat. Small anastomotic filaments connect the nerve close to its origin with the omaso-abomasal branch. Similar result was obtained by HABEL (1956) in the ox, but MOUSTAFA & FAHMY (1968) stated that before the ventral vagal nerve passes in the groove between the reticulum and omasum, it gives a nerve of considerable size which passes downward and slightly backward to terminate in a plexus in the portal area of the liver.

2. A terminal branch which passes on the reticulo-omasal junction to reach the right face of the omasum where it receives a number of connecting filaments from the pyloric nerve and the reticular nerves. It continues along the lesser curvature of the abomasum where it comes in contact with the dorsal branch of the omaso-abomasal vessel. The nerve insinuates between the two layers of the lesser omentum to reach the pyloric region where it divides into a dorsal and a ventral branch.

The short dorsal branch soon divides into a number of small branches which are distributed to the lesser curvature (in part) and to the right face of the abomasum as parietal branches (Rami abomasiales parietales) (Fig. II/4).

The long ventral branch follows the lesser curvature of the abomasum to the pyloric region. Small branches are given along its course to the omental fat and the pyloric region, some of which join those of the pyloric nerve.

3. The other terminal branch is thick and short. Owing to its relation to the reticulum it may be described as a cranial reticular branch. It descends ventrally on the cranial part of the reticulum and divides into a number of short reticular branches (Rami reticulum craniales) (Fig. II/2) which innervate the proximal part of the right surface and the left one (in part) as well as it supplies ruminal branches (Rami ruminales) (Fig. II/3) to the Atrium ruminis.

One of the collateral branches of the reticular nerve turns round the Atrium ventriculi to reach the left side where it comes in relation with the reticular vessels and joins the sympathetic plexus. It is observed that a number of small filaments given from the two terminal branches as well as from the pyloric nerve form together a nerve plexus. This plexus gives a number of fine filaments to the omasum and reticulum.

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