Study of stomach morphogenesis in sheep fetus

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Abstract : This study is performed to specify the rate and method of different parts of stomach and per formation, evolutonal and topography of them is sheep fetus. 14 sheep fetus in 38, 40, 45, 47, 52, 58, 66, 75, 80, 88, 103, 130, 150 days old was selected. 50 sheep pregnant uterus was selected from slaughter house and after aging and tagging, established in buffer 10% formalin. Then, we do autopsy on samples and evaluate the stomach position. Omasum in near 30 days old was seen toward of reticulum and results showed that grow thing mode is on vertical axis in 38 days old rumen is the biggest part and is in front of reticulum. In 47 days old rumen and reticulum size is equivalent. In near 52 days old rumen is grow thing and moving toward caudal and reticulum is moving for ward. In 66 days old rumen was the biggest part comparably and reticulum was seen in front of the other parts. In 103 days old, abomasums is very larger and extended and in 110 days old was the biggest part of stomach. Evaluations showed that at first rumen is in anterior position gradually rumen is growing and is moving to caudal, dorsal side of abomasums. At the end, reticulum is moving forward from under side of rumen and will be the highest anterior part of stomach. [Sajjad Hejazi, Hossein Erik-aghaji, Study of stomach morphogenesis in sheep fetus. Life Sci J 2013;10(5s):659-663] (ISSN:1097-8135). http://www.lifesciencesite.com, 116

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Introduction

Ruminants stomach are composed of four parts, rumen, reticulum, omasum and abomasums that the first three part is non glandular and the last part is glandual because of the appearance different ideas are based on that the first part is result from esophagus gradually growth and the other part from primary stomach stomach is the biggest sac shape of animal digestive treat that is between esophagus and duodenum. The primary stomach is positioning on longitudinal axis because or rations changes and moving from dorsal position to the left side. Also, a simultaneously torsion on horizontal axis is occurring that cause pylar moving to the right and forward side. This study is performing to specify the rate and method of different parts of stomach and per formation and evaluation of them. It is important to notice that we studied biometric sizes also.

Materials and method

Embryo samples were selected from slaughter house in 3 months and the ages of them were computed as X= 2.1(Y+1) formula. Then samples were tagged and holded in 10% formalin for 2 weeks. Perior to study, embryos were divided into 14 age groups. These age groups were divided into 38, 40, 45, 47, 52, 58, 66, 75, 80, 88, 103, 110, 130 and 150 days old groups. 3 samples were selected for all of the ages and the most suitable of them were evaluated. Studies started from light ages, in mature are available autopsy was started by opening of abdominal cavity of embryos, at first, we extracted the liver and then separated whole of stomach from abdominal cavity, we used loop in small samples for watching better. The cases were registered and finally compare with the other findings.

Results

In abdominal cavity topography findings in 38 days old embryo, stomach is tube form and that means is that it is originated from digestive treat. There are some small bulbs in digestive tract that transforms to rumen, reticulum, omasum and abomasums. Rumen bulb is hardly visible in front of treat and reticulum and omasum bulb side too. Omasum is seen as a very small swelling between rumen and reticulum at right side. In 40 days old embryo the findings distinguished that all of the four parts of stomach is seen as a longitudinal tube with swelling bulbs. The most cranial bulb is rumen with dorsal cranial position and reticulum's position is as a coudal ventral position to rumen. Pylorus has a pup shape and abomasums is the biggest bulb. Omasum bulb is in front of reticulum. In 45 days old embryo, rumen is at the most cranial part of the stomach. Reticulum is swelling at the left side of rumen and whale of abomasums was seen as larv shape in caudal part. Pylorus is moving to the bottom side with a hard angle in 47 days old embryo, rumen is at the most cranial part of stomach and reticulum is extended as high as rumen.
Fig1: Topography of sheep fetus abdomen at 38 days gestation, A,C) right & B,D) left view. 1) rumen 2) retinaculum 3) omasum 4) abomasums 5) pylor 6) crown 7) rump

Fig2: Topography of sheep fetus abdomen at 40 days gestation, A,C) right & B,D) left view. 1) rumen 2) retinaculum 3) omasum 4) abomasums 5) pylor

Fig3: Topography of sheep fetus abdomen at 45 days gestation, A,C) right & B,D) left view. 1) rumen 2) retinaculum 3) omasum 4) abomasums 5) pylor

Fig4: Topography of sheep fetus abdomen at 47 days gestation, A,C) right & B,D) left view. 1) rumen 2) retinaculum 3) omasum 4) abomasums 5) pylor

Also, reticulum is in posterior part of rumen and abomasums is in posterior part of stomach too. Pylorus is in the larv form towards and omasum was seen at the right side of stomach in 52 days old embryo, rumen is pushing reticulum toward by a caudal movement. Rumen clefts are obvious and clear and reticulum is the most cranial part of stomach abomsum is moving dorsally to the bottom part of rumen and reticulum. Abomasums is moving forward with a hard angle in 58 old embryo, the situation is like 52 days old embryo reticulum is on forward side of rumen and longitudinal clefts is very obvious omentum connections is visible and abomasums is standing as horizontal position at left side obomasum's pylorus is moving forward.

Fig5: Topography of sheep fetus abdomen at 52 days gestation, A,C) right & B,D) left view. 1) rumen 2) retinaculum 3) omasum 4) abomasums 5) pylor

Omasum is at right side and under reticulum. Behind in abomsum's fundus. In 66 days old embryo, rumen septum is completely hyaline and thinner than other parts of stomach in these embryos groups blind sacs is seen un-noteable.
In 75 days, old embryo, reticulum is on front of rumen and rumen is standing caudal – dorsal position. Rumen septum is very thin than other stomach parts.

Rumen clefts is more obviously and blind sacs of rumen were visible noticeable in these embryo's group, abomasums has a horizontal position and pylorus is moving forward with a hard angle. Omasum was visible at right side too. In 80 days old embryo, rumen's longitudinal clefts and blind sacs were very noticeable. Reticulum is standing at the most cranial part of stomach and abomasums is at left side completely, and slant form. Pylorus was moving to the middle side of body and forward. Omasum was seen at right side with a extended dimension. In 88 days old embryo has a caudal–dorsal position and is the biggest part of stomach. Rumen's longitudinal clefts is more deep and reticulum is at most cranial part of stomach. Abomasums is under rumen and reticulum and is vertical. Pylorus is moving forward with a hard angle and omasum is standing under reticulum at right side' behind the fundus.

In 103 days old embryo' omentum connection to rument longitudinal clefts is obvious reticulum is the most cranial part of stomach and
beehavely scene is obvious from outside abomasums has a noticeable volumetric expansion and is the biggest part of stomach omasum is the smallest part of stomach.

Fig11: Topography of sheep fetus abdomen at 103days gestation, A,C)right & B,D)left view
1)rumen 2)retinaculum 3)omasum 4)abomasums 5)pylor 6)spleen

Fig12: Topography of sheep fetus abdomen at 110days gestation, A,C)right & B,D)left view
1)rumen 2)retinaculum 3)omasum 4)abomasums 5)pylor 6)spleen

Fig13: Topography of sheep fetus abdomen at 130days gestation, A,C)right & B,D)left view
1)rumen 2)retinaculum 3)omasum 4)abomasums 5)pylor 6)spleen

Fig14: Topography of sheep fetus abdomen at 150days gestation, A,C)right & B,D)left view
1)rumen 2)retinaculum 3)omasum 4)abomasums 5)pylor 6)spleen

In 110 days old embryo, rumen's longitudinal clefts have been more deep and blind sacs is seen obviously reticulum is at most cranial part of stomach. Abomasums position is changing from vertical from to slant form and is the biggest part of stomach pylorus is moving forward and beehive scene of reticulum is also obvious from outside. Omosum is visible under reticulum from right side as solid mode. In 130 days old embryo, the rumen's longitudinal clefts is deep and reticulum is standing at cranial position of stomach omasum is the smallest part of stomach and abomasums is the biggest part. Abomasums fundus has a slant form. Abomasum's pylorus is moving forward and right side and is standing behind of all parts of stomach.

In 150 days old embryo, the distal part of pylorus was seen at right side of abdominal cavity obviously: reticulum is standing in front of stomach completely and rumen's longitudinal clefts and it's blind sacs were visible obviously. Rumen's vestibule was seen obviously between cranial cleft and reticulum omasum is the smallest part of stomach and abomasums is the biggest one and was moving to the right side with a oblique form abomasums is under other parts of stomach and pylorus had been moved to the right side.

Discussion
In abdominal cavity topographical study of 38 days old embryo, become specified that stomach is originated from tube form primary intestine. In a study conducted on lambs, It is specified that different part of stomach origins unique in ruminants. Also, in on other study conducted on 50 deer embryos, it is specified that rumen originate from primary digestive tract, and it will be visible from 60 days later. In human, in fourth week, stomach
development is originated from cranial intestine as a
spindle expansion and changes to bulbs in
differentiation period. At the early sixth week of
pregnancy, stomach fundus expands cranial-dorsal
position and turns to the left side. This part of
stomach in sheep creates primary rumen. A
diverticulum from stomach fundus creates reticulum
as caudal – ventral position. Rumen is the biggest
part of stomach until 80 days old of embryo in 88
days old, rumen and abomasums sizes are near
together and from 103 days old and after this day the
growth rate of abomasums will be higher than rumen.
This growth manner will continue after birth until the
end of infancy period. In seventh week, rumen is
changing from cranial – dorsal to caudal – dorsal
position. In nearness of 58 days old omentum is
visible in human stomach position changing, done by
longitudinal and cranial caudal axes rotation.
Stomach rotation is 90 degree on longitudinal axis
and is like clock relation in dog unilateral
enlargement of a part of cardia left side creates
fundus. In this animal, rotation on longitudinal axis,
will result in moving the stomach from dorsal
position to the left side and finally turns to great,
curvature. In Seventh week, reticulum is moving
forward because of rumen moving to caudal side. In
nearly 50 days old remen longitudinal clefts position
and in nearly 66 days old it’s blind sacs is appearing.
In these days rumen is changing from quadre sheep to
rectangle shape and growth in horizontal cranial –
caudal axis. Beehive mucus of reticulum in 80-100
days old is visible from outside and has a dorsal –
ventral axis growth. Also it is distinguished that
omasum is the smallest part of small ruminants that
in nearly 30 days old is produces as bulb form in
front of reticulum. Study of development and growth
of omasum distinguished that this organ has a vertical
axis growth (dorsal – ventral), abomasum is standing
under the reticulum and near fundus at the left side of
stomach. In cow embryo at 28 m size, omasum is
visible from lesser curvedure of stomach that is at
time the right and mental side of stomach. Abomasums
pylorus position is changing at seventh
week abomasums is the biggest part at birth time.
Abomasums is facing with a lot of angle changing in
developmental process. It means that abomasums in
nearly 40 days old is at the most caudal part of
stomach and then is pushing from caudal position to
the under part of rumen. Abomasums is finally
changing from vertical position to oblique form (from
left to the right side), pylorus of Abomasum, at first,
has a ahead angle that will pushing to the right and
upper side. In the other sentence pylorus is visible
from right side of abdominal cavity at the birth time.
Rotation of rumen vestibulum between rumen cranial
cleft doesn’t happen in sheep embryo stomach in
comparison with simple stomach animals.

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