IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 7 Ver. VI (July. 2016), PP 51-53
www.iosrjournals.org

Topography of Ganglion Cells in the Inflammatory Appendicular Muscle Coat

Rajeswara Rao N[1], Bhavani Prasad[2], Swayam Jothi, S[3],
Hemanth Kommuru[4], Bodepudi Narasimha Rao[5]
[1,3,4]*Shri Sathya Sai Medical College & Research Institute Kancheepurum TN*
[2]*Pondichery institute of Medical Sciences Pondicherry*
[5]*All India Institute of Medical Sciences, Bhubaneswar Odisha*

Abstract: *Neural crest cell give rise to myenteric plexus. It is usually distributed between longitudinal & circular muscle layers but their distribution varies. Therefore this study is taken up to demonstrate the topography of ganglion cells in the inflammatory appendicular muscle coat.*
Materials & Methods: *A total of 112 Appendicitis cases were sectioned, stained (H&E) and reported by pathologist were studied. Of them, 63 are chronic appendicitis, 24 acute appendicitis, 23 Acute or chronic appendicitis and 2 are histologically normal.*
Observations: *VII patterns of distribution were observed. Hypertrophy of the ganglion cells were observed with or without obstructive causes like faecolith or lymphoid hyperplasia.*
Conclusion: *Stimulation of the Myenteric plexus increases the motor activity of the gut by increasing tone & rate of rhythmic contractions (peristaltic movements) along the tract which is required to expel the contents distally. Probably this may be the reason for neuronal hypertrophy in chronic appendicitis .*
Keywords: *Myenteric plexus, appendicitis, neuronal hypertrophy.*

I. Introduction

Neural crest cells (NCCs) that originate from the neuroepithelium of the neural tube differentiate into neurons and glia of the enteric nervous system (ENS). Normally neurons and glia coalesce into ganglion plexuses in the myenteric region between the longitudinal and circular muscle layers (M. Fu et al 2004).The muscle cells lie approximately parallel to each other, usually forming sheet-like layers or coats. The Myenteric plexus can be visualized as mesh-like laminar structures, i.e. wide and thin ganglia spread over a surface and joined to each other by connecting strands. The mesh formed by the ganglia and the connecting strands has a regular pattern, which is characteristic of each segment of the alimentary tract in humans and to some extent also of the animal species. Whether these patterns have any significance and whether they bear any relation to the functional properties of the organ is unclear. As a manifestation of order, they pose a challenging problem of morphogenesis and intercellular organization (Éva Fekete et al 2000).Therefore this study is taken up to demonstrate the topography of ganglion cells in the inflammatory appendicular muscle coat

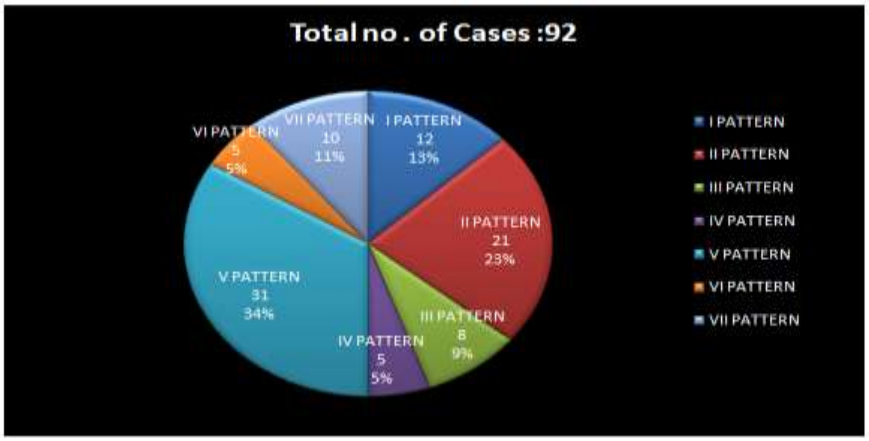
II. Material and Methods

A total of 112 Appendicitis cases were sectioned, stained (H&E) and reported by pathologist were used for present study. In which 63 are chronic appendicitis, 24 acute appendicitis, 23 Acute or chronic appendicitis and 2 are histologically Normal .Presence of ganglion cells and their position was observed in different inflammatory conditions. Out of 112 cases in 20 cases we could not make out ganglion cells and in the remaining 92 ganglion cells were seen prominent in which 20 Acute, 48chronic 24 acute on chronic. A detailed study was done on the position of ganglion cells in the muscle coat of the appendix in different inflammatory conditions of appendicitis

III. OBSERVATIONS /RESULTS:

Of the 112 cases 92 cases showing prominent ganglion cells were studied. Different patterns of ganglion cells in the muscle coat of appendix in inflammatory conditions showed 7 patterns.
I-PATTERN/ NORMAL -Out of 92 cases 12 cases (13%) ganglion cells were present at the junction between the circular and longitudinal coat (Fig no : 1) in which 3 was acute,3 chronic and 6 acute on chronic
II-PATTERN - In 21 cases(23%) ganglion cells were present within the circular layer of muscle coat (Fig no: 2) in which 4 were acute, 12 chronic and 5 acute on chronic.
III –PATTERN- The presence of ganglion cells within the longitudinal layer of muscle coat (Fig no: 3) in 08 Specimens(9%) in which 1 acute, 6 chronic,1 acute on chronic .

IV-PATTERN – The presence of ganglion cells at the junction between the longitudinal and circular and circular fibers (Fig no : 4) was seen in 31cases (34%) in which 8 acute ,15 chronic and 8 acute on chronic
V-PATTERN- In 05 cases(5%) ganglion cells were found at the junction between the longitudinal and circular and within longitudinal fibers (Fig no : 5) in which 1 acute, 3chronic and 1 acute on chronic.
VI-PATTERN- In 05 cases (05%) cases Ganglion cells were seen both in longitudinal and horizontal muscle coat (Fig no : 6) in which 1 acute ,2 chronic and 2 acute on chronic
VII- PATTERN -The ganglion cells found in all the three planes (Fig no : 2) in 10 cases (11%) in which 1acute,8 chronic and 1 acute on chronic



Distribution of Ganglion cells in the Muscle coat of appendix

(**C**-Circular layer, **L**- Longitudinal layer**, G-** ganglion cells)

Fig no: 1(Pattern- I)

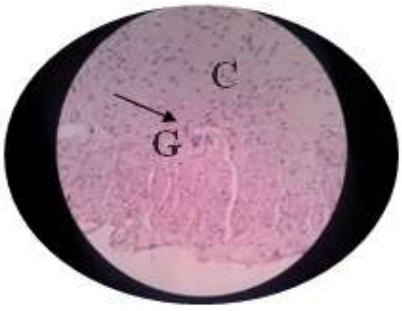


Fig no : 2 (Pattern –II)

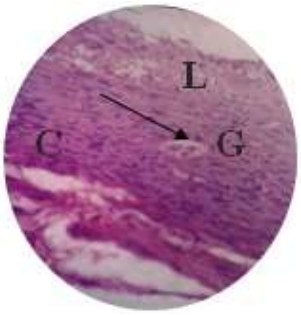


Fig no: 3(Pattern- III)

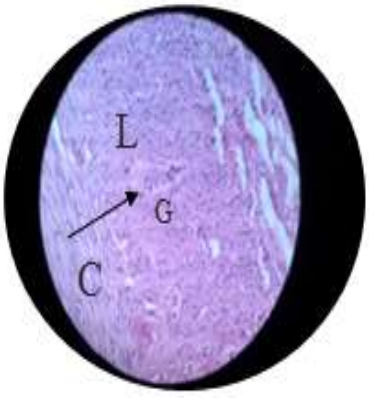


Fig no: 4 (Pattern – IV)

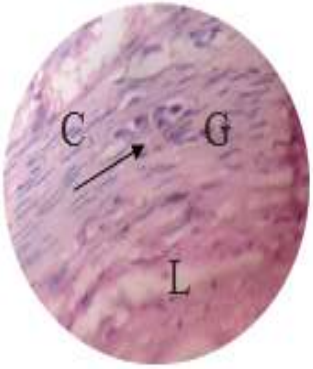


Fig no: 5 (Pattern –V)

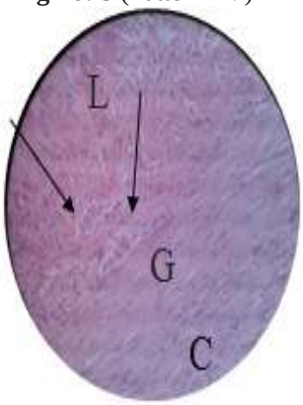


Fig no: 6 (Pattern –VI)

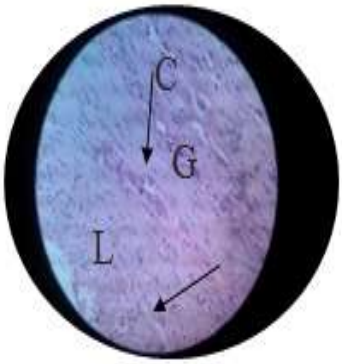
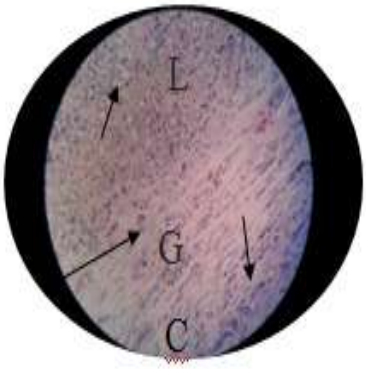


Fig no: 7(Pattern VII)



IV. Discussion

According to M. Fu et al (2004) the normal position of ganglion cells in the muscle coat of gut was between longitudinal and circular layers. In the present study in 12 cases (13%) of appendicitis the same finding was noted and was described as Pattern I in the present study In 21 cases (23%) the ganglion cells were present within the circular layer of muscle coat (Pattern II) .In 8 cases (9%) ganglion cells were present within the longitudinal layer of muscle coat (Pattern III). In 31cases (34%) ganglion cells were at the junction between the circular and longitudinal and within circular fibers of muscle coat which was described as (Pattern IV). In 5 cases (5%) ganglion cells were present at the junction between the circular and longitudinal and within longitudinal fibers (Pattern V) . Ganglion cells were seen within in longitudinal as well as in horizontal muscle coat in 5cases (5%)(pattern VI) . Ganglion cells were present in all the three planes in 10cases (11%)(Pattern VII)

V. Conclusion

The position of ganglion cells in chronic appendicitis varied magnificently giving rise to all the patterns described. This shows that neuronal hypertrophy is likely to occur in appendicitis (acute &sub acute) and more so in chronic appendicitis with or without luminal obstruction. Obstruction caused by fecolith or lymphoid hypertrophy may trigger this condition

VI. References

[1]. Éva Fekete1*, Mária Bagyánszki1, Béla A. Resch2 Prenatal development of the myenteric plexus in the human fetal small intestine Acta Biologica Szegediensis Volume 44(1-4):3-19, 2000

[2]. Hayato Yamauchi1, Shinji Sakurai2, Ritsuko Tsukagoshi1, Masaki Suzuki1, Yuichi Tabe1,Takaharu Fukasawa1, Shinsuke Kiriyama1, Minoru Fukuchi1, Hiroshi Naitoh1,A Case of Diffuse Neuronal Hypertrophy in Acute Appendicitis: Int Surg 2012;97:249–253

[3]. M. Fu · P. K. H. Tam · M. H. Sham · V. C. H. LuiEmbryonic development of the ganglion plexusesand the concentric layer structure of human gut:a topographical study :Anat Embryol (2004) 208:33–41DOI 10.1007/s00429-003-0371-0

[4]. Usha Rani Singh . Anu Malhotra . Arati Bhatia Eosinophils, mast cells, nerves and ganglion cells in appendicitis: Indian J. Surg. (September–October 2008) 70:231–234