



ARTERIES IN RELATION TO CELIAC GANGLION

Anatomy

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ABSTRACT

**Background:** The study was conducted to find out the arterial relationship of celiac ganglion. The term celiac ganglion is related to the proximity of the ganglion to celiac artery. Celiac ganglion has close relationship with the celiac artery and superior mesenteric artery. Variation in relationship of the ganglion to these arteries is a recognised fact. **Methods:** Seventeen males and three females adult embalmed cadavers were dissected for this study. A midline abdominal incision was given in all the cadavers and stomach, duodenum, small intestine, large intestine, liver and spleen were removed. Diaphragm, posterior abdominal wall and abdominal aorta with its branches were preserved. Peritoneum was removed carefully from the anterior surface of celiac ganglia. Care was taken to not to disturb the ganglion from underlying fascia and thus preserving the accurate relationship to the arteries. **Conclusion:** The ganglion was inferolateral to celiac artery in 90% (36 out of 40) cases. 10% (4 out of 40) were superolateral to the celiac artery. The ganglion was superolateral to the superior mesenteric artery in 100% (20 out of 20) cases on right side and 90% (18 out of 20) cases on left side. It was inferolateral to superior mesenteric artery in 10% (2 out of 20) on left side.

KEYWORDS

Celiac ganglion, Celiac Artery, Superior mesenteric artery.

INTRODUCTION

Anatomical variations of celiac ganglion are a subject of interest amongst anatomist of all over world, with a difference of opinion regarding its various parameters. It is the largest plexus of sympathetic nervous system. The term celiac plexus is related to the proximity of the ganglion to celiac artery. The location of the celiac ganglia is usually described in relation to surrounding structures, and also show variation in size and general morphology. Clinically, the celiac plexus plays a major role in pain management for upper abdominal disorders, particularly chronic pancreatitis and pancreatic cancer. The study was conducted to find out the relationship of celiac ganglion with the celiac artery and superior mesenteric artery, so that a predictable pattern of relationship could be established.

MATERIAL AND METHODS

Twenty embalmed adult cadavers (seventeen males and three females) were dissected for this study in the department of Anatomy, Maulana Azad Medical College, New Delhi. A midline abdominal incision was given and liver, stomach, spleen, duodenum, small intestine was removed with the preservation of diaphragm, posterior abdominal wall and abdominal aorta with its branches. The celiac ganglion was identified the peritoneum on its anterior surface was removed carefully. Great care was taken to preserve the true anatomical relation to celiac artery and superior mesenteric artery.

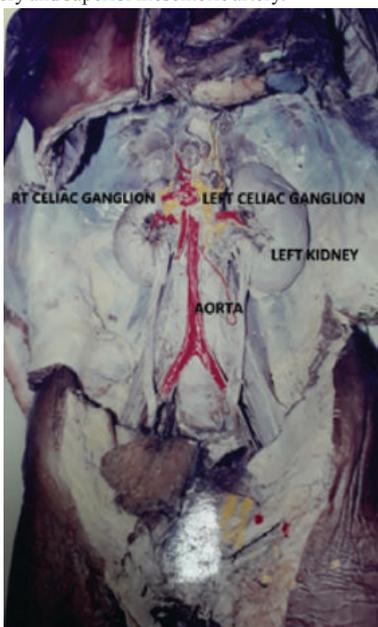


Fig 1: Right and Left Celiac ganglion



Fig 2: Right and left celiac ganglion and the relation with celiac artery and superior mesenteric artery.

RESULTS

Relations of the ganglion to celiac artery:

The ganglion was inferolateral to celiac artery in 18 out of 20 cases on right side and 18 out of 20 cases on left side. 2 ganglia on right and 2 ganglia on left side were superolateral to the celiac artery.

Table 1(a): Relation of the celiac ganglion with the celiac artery

Cadaver	Sex	Right Ganglion	Left Ganglion
1	Male	Inferolateral	Inferolateral
2	Male	Inferolateral	Inferolateral
3	Male	Inferolateral	Inferolateral
4	Male	Inferolateral	Inferolateral
5	Male	Inferolateral	Inferolateral
6	Male	Inferolateral	Inferolateral
7	Male	Inferolateral	Inferolateral
8	Female	Inferolateral	Inferolateral
9	Male	Inferolateral	Inferolateral
10	Male	Inferolateral	Inferolateral
11	Male	Inferolateral	Inferolateral
12	Male	Inferolateral	Inferolateral
13	Male	Inferolateral	Inferolateral
14	Male	Superolateral	Superolateral
15	Male	Inferolateral	Inferolateral
16	Male	Inferolateral	Inferolateral
17	Female	Inferolateral	Inferolateral
18	Female	Inferolateral	Inferolateral
19	Male	Superolateral	Superolateral
20	Male	Inferolateral	Inferolateral

Table 1(b): Relations of the celiac ganglion with celiac artery.

	Superolateral	Inferolateral	Total
Right side	2	18	20
Left side	2	18	20
Total	4	36	40

Relation of the celiac ganglion with superior mesenteric artery The ganglion was superolateral to the superior mesenteric artery in 20 out of 20 cases on right side. Two ganglia were inferolateral to superior mesenteric artery on left side.

**Table 2(a): Relation of the celiac ganglion with superior mesenteric artery.**

Cadaver	Sex	Right ganglion	Left ganglion
1	Male	Superolateral	Superolateral
2	Male	Superolateral	Superolateral
3	Male	Superolateral	Superolateral
4	Male	Superolateral	Superolateral
5	Male	Superolateral	Superolateral
6	Male	Superolateral	Superolateral
7	Male	Superolateral	Superolateral
8	Female	Superolateral	Superolateral
9	Male	Superolateral	Superolateral
10	Male	Superolateral	Superolateral
11	Male	Superolateral	Superolateral
12	Male	Superolateral	Inferolateral
13	Male	Superolateral	Superolateral
14	Male	Superolateral	Superolateral
15	Male	Superolateral	Inferolateral
16	Male	Superolateral	Superolateral
17	Female	Superolateral	Superolateral
18	Female	Superolateral	Superolateral
19	Male	Superolateral	Superolateral
20	Male	Superolateral	Superolateral

**Table 2(b): Relation of celiac ganglion with superior mesenteric artery.**

	Superolateral	Inferolateral	Total
Right side	20	0	20
Left side	18	2	20
Total	38	2	40

## DISCUSSION

The celiac plexus serves as a redistribution or synaptic centre for autonomic fibres of all the abdominal viscera except pelvic organs. It contains visceral efferent neurons of both the sympathetic and parasympathetic outflows, and in addition, visceral afferent fibres which mediate sensory impulses to the central nervous system via either the sympathetic or the parasympathetic nervous system (3). The plexus is located deep in the retroperitoneum, over the anterolateral surface of the aorta and around the origin of celiac trunk. It serves as a relay centre for nociceptive impulses that originates from the upper abdominal viscera (8). Chronic abdominal pain is a significant health problem in society today. It is readily prevalent in up to 75% of adolescents and 50 % of adults (5, 7). Chronic abdominal pain is the most reason for outpatient clinic visit (3).

Celiac plexus neurolysis is an effective means of diminishing pain that arises from these structures. Celiac ganglion is located near the origin of celiac artery and superior mesenteric artery (10,2). (13) found that left ganglion is slightly more caudal than the right to the celiac artery. Because of indistinct boundaries, considerable variation of the plexus in relation to great vessels like celiac artery and superior mesenteric artery is expected. (1, 4, 6) described the celiac ganglia lying on either side of aorta at the level of origin of celiac artery. In our study we found that 36 out of 40 ganglia (18 on right and 18 on left) were inferolateral to the celiac artery.

These observations were similar to the findings of (14) that the celiac ganglion was inferior to the origin of celiac artery and the ganglion was directed inferolaterally. In this study 4 ganglia (2 on right and 2 on left) were superolateral to celiac artery. These findings can be compared to the observations of (9) who found 2 ganglia lying on respective crura of the diaphragm and flanking the aorta lateral to the origin of celiac artery.

38 out of 40 ganglia (20 on right and 18 on left) were superolateral to the superior mesenteric artery. 2 ganglia on left were inferolateral to superior mesenteric artery. These findings can be compared with (12) who found the relations among ganglia, celiac and superior mesenteric artery. They found 96% of the ganglia were related to both vessels on both sides. In 4% of cases the ganglia were related to superior mesenteric artery only and had no relation to the celiac artery at all.

The findings of this study can also be compared to the observations of (8, 11). The study shows that the relationship of the ganglion to the celiac and superior mesenteric artery varies not only from case to case but also in same person. This fact is of great importance for the clinicians while using celiac plexus block for the intractable pain of upper abdominal malignancies.

## CONCLUSIONS:

Relations of the ganglion to celiac artery: (Table: 1a & 1b)

The ganglion was inferolateral to celiac artery in 90% cases on right and left side. 10% ganglia on right and left side were superolateral to the celiac artery.

Relation of the celiac ganglion with superior mesenteric artery: (Table:2a & 2b)

The ganglion was superolateral to the superior mesenteric artery in all cases on right side and 90% (18 out of 20) cases on left side and inferolateral to superior mesenteric artery in 10% (2 out of 20) cases on left side.

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## Conflict Of Interest: None

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