A STUDY IN PATIENTS OF LAPAROSCOPIC MEDIAN ARCUATE LIGAMENT RELEASE

Dr.Vineeta Neeraj Kumar
BHMS,MD(Hom), DNHE
Assistant Professor, Department of Surgery, Aarihant
Homoeopathic Medical College & Research Institute, Swarnim Startup
And Innovation University, Bhoyan Rathod, Near ONGC WSS, Adalaj
Kalol Highway, Gandhinagar, Gujarat-382420
EMAIL- Vineeta.nkumar@gmail.com

AIM- To study pre-operative and post-operative management of patients of laparoscopic median arcuate ligament release

METHOD- A study of 10 patients presented in surgical OPD of tertiary care hospital of radiologically proven median arcuate ligament syndrome over a period of 12 months. Patients requiring surgery were selected for the study. All the patients underwent laparoscopic Median arcuate ligament release. Post-operatively celiac artery doppler was done in all the patients. Asymptomatic patients and those undergoing open surgery for median arcuate ligament release were excluded from the study.

RESULTS- Median arcuate ligament syndrome presents most commonly between 3rd and 5th decades with male preponderance. Commonly presenting with epigastric pain or postprandial fullness. Radiological investigations are pivotal in the diagnosis and postoperative assessment. Laparoscopic median arcuate ligament release is an extremely effective surgery having substantial reduction in symptoms post operatively.

CONCLUSION- Laparoscopic release of median arcuate ligament was found to be effective in substantially reducing the symptoms most commonly chronic abdominal pain ofthe patients of median arcuate ligament syndrome with short post-operative stay. Radiological investigations prove useful in diagnosis and post-operative evaluation. Early surgical intervention significantly improves the symptoms and prevents future complications including intestinal ischemia and need for emergency laparotomy surgeries. There is significant improvement in post operative blood flow based on post-operative investigations such as celiac artery doppler studies done on post operative day 1.

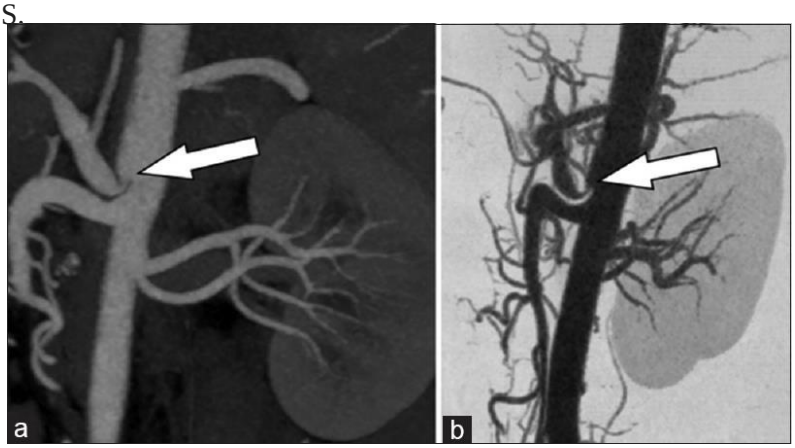
KEYWORDS-
Median arcuate ligament syndrome, Laparoscopic release of median arcuate ligament,Chronic abdominal pain

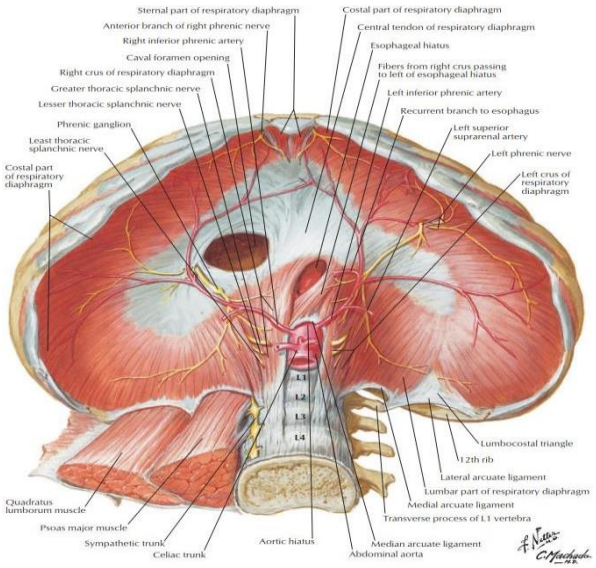
INTRODUCTION-

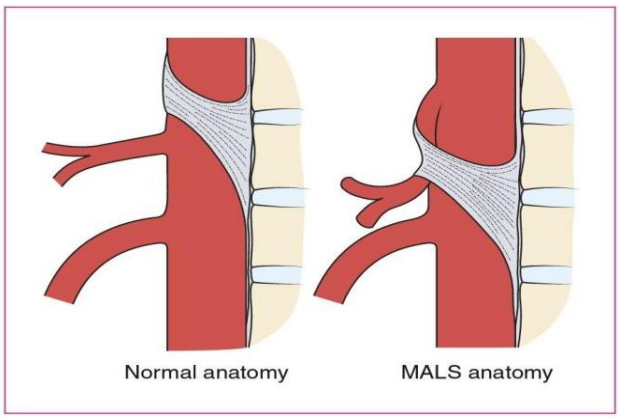
Median arcuate ligament syndrome (MALS) or Dunbar syndrome is a rare clinical disease and diagnosis of exclusion characterized by compression of celiac trunk by median arcuate ligament, prominent fibrous bands.

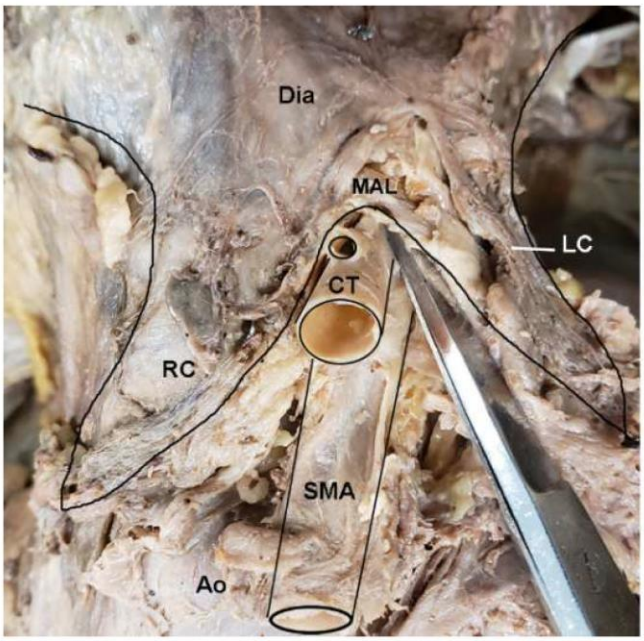
Median arcuate ligament forms the fibrous arch forming a junction between right and left crura of diaphragm. It forms the antero-superior boundary of aortic hiatus at the level of 1st lumbar vertebra just above the origin of celiac artery. There may be low riding of the fibrous attachment of or the diaphragmatic cruras themselves may lie lower down covering the celiac artery causing its compression. Alternatively celiac artery may have a higher origin leading to similar picture. External compression on celiac artery by median arcuate ligament leads to triad of symptoms whichincludes postprandial epigastric pain, vomiting and weight loss. Presenting clinical symptoms are various gastrointestinal symptoms like chronic postprandial epigastric pain, nausea, vomiting, abdominal fullness, weight loss, anorexia, sometimes, abdominal pain during body exercise caused by an intermittent visceral ischemia. It may cause foregut ischemia due to inadequate collateralsor mid gut ischemia due to diversion of blood to foregut. Besides the extrinsic vascular compression, Median arcuate ligament syndrome has a multifactorial etiology and it has been suggested as a neurogenic disease resulting in altered sensation and pain from the somatic nerves in the splanchnic plexus.

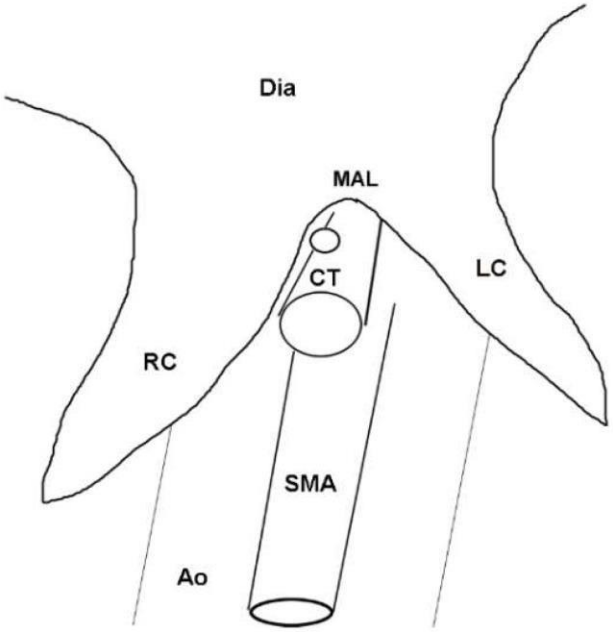
MALS is ordinarily diagnosed after the exclusion of other more common conditions; however, variety of imaging and diagnostic modes, including Duplex ultrasonography, contrast enhanced computed tomography, CT angiography, MR angiography, gastric tonometry and angiography can suggest findings consistent with MALS.











Degree of external compression can be estimated with help of percentage of stenosis seen in angiogram

Treatment options include release of median arcuate ligament (open, laparoscopic or robot-assisted)and open vascular reconstruction. Laparoscopic approach for the correction of MALS is consideredto be feasible and safe.

Key operative steps of Laparoscopic Median Arcuate Ligament Release,

-Left lobe of liver is retracted using bowel grasper and stomach retracted using Babcock's forceps.

-Lesser omentum is divided along the lesser curvature to enter lesser sac.

-Esophagus identified, dissected and umbilical tape is used to retract esophagus

-Right and left crura of diaphragm are dissected till Aorta is visualized.

-Dissection done and aorta is traced in above downward direction till origin of celiac trunk isreached.

-Fibers of median arcuate ligament around celiac artery are dissected until no external compressionis present over celiac artery

On intraoperative exploration, the celiac artery was found to be encased and partially compressed by fibrotic tissue in each patient. In each case laparoscopic excision of fibrotic tissue, celiac plexus and ligament division was performed. Intra-operative doppler can be performed to evaluate real- time change in compression and dissection can be continued till adequate reversal of compression is achieved.

MATERIALS AND METHODS- A study of 10 patients presented in surgical OPD of tertiary care hospital of radiologically proven median arcuate ligament syndrome over a period of 12 months. Patients requiring surgery were selected for the study. All the patients underwent laparoscopic Median arcuate ligament release. Post-operative celiac artery doppler was done onpost operative day 1 in all the patients.

INCLUSION CRITERIA-

1. All patients with Median arcuate ligament syndrome (MALS) and radiologically confirmed external compression of celiac artery by medial arcuate ligament and underwent laparoscopic median arcuate ligament release.

EXCLUSION CRITERIA-

1. All patients with incidental radiological finding of celiac trunk compression but asymptomatic.
2. All patients who underwent surgery through open approach.

RESULT-

1. Age distribution

In our study, it was observed that 4 out of 10 patients that suffered from MALS were of 31-40 yearsof age (40%) followed by the age group of 41-50 years (30%). It was observed that younger and older spectrums of the age group were less frequently found to be suffering from MALS.

2. Gender distribution

In our In our study, MALS was observed to have male preponderance with 8 out of 10 patients (80%) being male and only 2 of the 10 patients were females.

3. Chief complaint

Complaints	**No. of patients**	**Percentage**
Epigastric pain	3	30%
Postprandial fullness	3	30%
Weight loss	1	10%
Vomiting	2	20%
Anorexia	1	10%

In our study 5 presenting complaints were observed of which 3 out of 10 patients presented with epigastric pain (30%) or postprandial fullness (30%) as presenting complaint. Weight loss and anorexia were found least commonly (10%) as the chief complaint although these were frequently found as associated complaints with either epigastric pain or postprandial fullness. 2 out of 10 patients (20%) presented with complaint of non-bilious, non-projectile vomiting containing food particles.

4. Radiological investigations

Percentage of compression on angiogram (%)	No. of patients	Percentage
20 to 30%	2	20%
30 to 40%	3	30%

40 to 50%	3	30%
50 to 60%	1	10%
60 to70%	1	10%

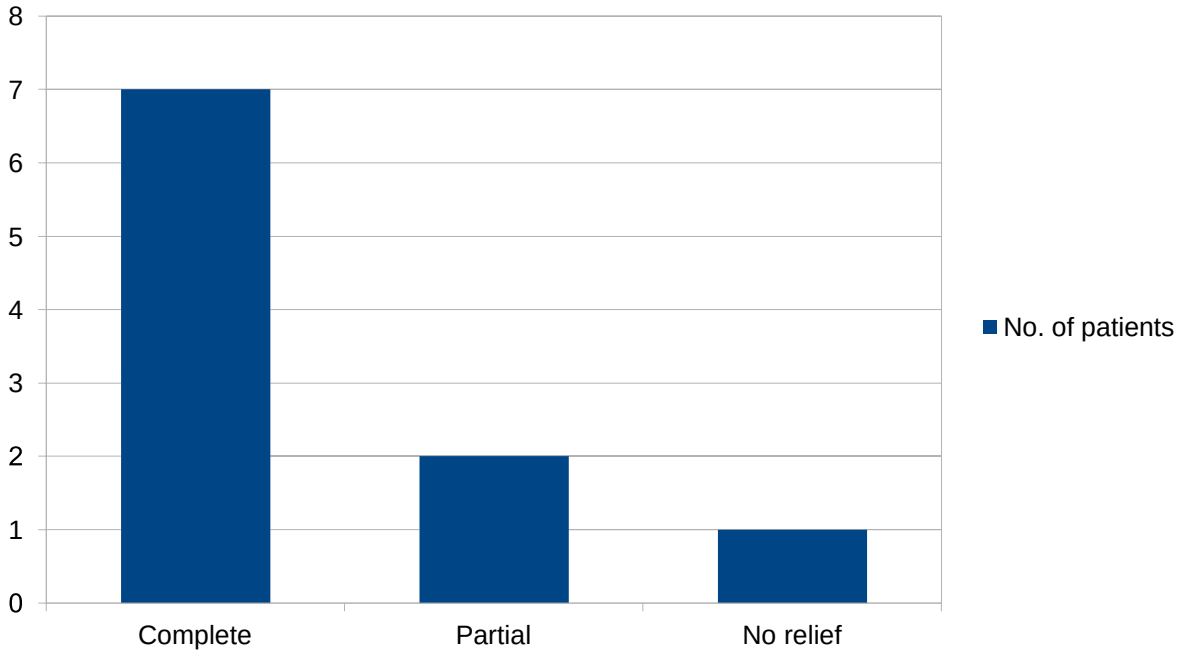
Angiogram is considered as an important tool in assessing the severity of the disease and subsequently predicting the chances of complications and prognosis post operatively. In our study itwas observed that 3 out of 10 patients had 30-40% compression of the celiac artery and other 3 out of 10 patients had 40-50% compression thus 60% of the patients had 30-50% compression and 80%patients had less than 50% compression.

5. Examination

Finding	No. of Patients	Percentage
Abdominal bruit	4	40%
Abdominal tenderness	1	10%
Abdominal Distension	2	20%
No positive findings on examination	3	30%

In our study, on examining the patients of MALS auscultatory abdominal bruit was most commonlyobserved finding present in 4 out of 10 patients (40%) and in 3 out of 10 patients (30%) patients the examination revealed no abnormalities. Abdomen was found to be distended in 2 out of the 10 patients (20%) and 1 patient (10%) had abdominal tenderness.

6. Post-operative relief of symptoms



In our study, it was observed that complete relief from symptoms could be achieved in 7 out of 10 patients(70%) and no relief in just 1 out of 10 patients(10%). 2 out of 10 patients(20%) had partial relief from the symptoms. Overall, 90% of the patients showed improvement from their pre- operative state after laparoscopic release of median arcuate ligament.

7. Post operative celiac artery re-establishment of blood flow

Re-establishment of bloodflow	No. of patients	Percentage
Complete	10	100%
Partial	0	0%
None	0	0%

Celiac artery doppler is done on post operative day 1 to evaluate the adequacy of the laparoscopic median arcuate ligament release. In our study all 10 patients (100%) achieved complete re- establishment of blood flow on post operative celiac artery doppler study.

SUMMARY

In our study, these are the findings that we have summarized,

- Majority of patients presented in 3rd-5th decade of life with a mean age of 34.6 years
- Male preponderance (80%) was noticed in cases of medial arcuate ligament syndrome.
- Epigastric pain (30%) and Postprandial fullness (30%) are the most common chief complaintin our study

followed by vomiting (20%). The other symptoms that we noticed in our study was anorexia (10%), weight loss (10%).

- Mean percentage of celiac artery compression in the patients was 35.5%
- On examination, abdominal bruit was most commonly observed finding present in 40% patients and in 30% patients the examination revealed no abnormalities. Abdomen was foundto be distended in 20% patients and 10% patients had abdominal tenderness.
- Complete reversal of symptoms could be achieved in 70% of patients and partial relief in 20% of patients. 1 patient in the study continued to have postprandial pain after undergoing laparoscopic median arcuate ligament release.
- Celiac artery doppler was done on post operative day 1 and 10 out of 10 patients (100%) achieved complete re-establishment of blood flow marking adequate release of median arcuate ligament.

RESULT

- We successfully treated 9 out of 10 patients through laparoscopic median arcuate ligamentrelease.
- 1 patient continued to have symptoms despite the surgery and will need further work-up forthe cause of symptoms.
- Post-operative celiac artery doppler done on post operative day 1 showed complete re-establishment of blood flow in 10 out of 10 patients.

CONCLUSION

Median arcuate ligament syndrome presents most commonly with epigastric pain or post postprandial fullness. Clinical examination and radiological investigations like CT or MR angiography or CECT abdomen form the basis of the diagnosis after excluding other possible conditions.

Early surgical intervention prevents future complications including intestinal ischemia and need for emergency laparotomy surgeries There is significant improvement in post operative blood flow based on post-operative investigations such as celiac artery doppler studies. Laparoscopic surgery has additional benefit of having shorter post operative stay, less post operative pain and more cosmetic suture line

Following laparoscopic median arcuate ligament release 90% of the patients having shown improvement in symptoms post operatively and there was complete re-establishment of celiac arteryblood flow in all 10 out of 10 patients (100%) as evident by celiac artery doppler done on post operative day 1 which marks sufficient release of median arcuate ligament.

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