When is abdominal lymphadenopathy significant in children?

Neeraj Kumar Rao[1], Moinak Sen Sarma[2]

Abdominal lymph nodes are usually the "healthy policemen of the abdomen" and signify a robust gut immunity. Widespread use and easy access to imaging has allowed abdominal lymphadenopathy (AL) to become a worrisome issue for pediatricians and parents. AL is often over-reported with non-specific phrases such as "increased or decreased bowel peristalsis" or "mild bowel wall thickening" on sonography. In a quest for etiology, its persuasion leads to unwarranted workup, dietary exclusions and irrational antimicrobial (especially anti-tubercular therapy) usage. It is important to distinguish disease-related AL versus an incidentally detected AL.

Figures 1 a-d show the normal lymph node distribution in the abdomen. The exhaustive list of causes of AL is beyond the scope of this mini-review. AL is encountered in three clinical scenarios I) incidentally detected with no abdominal issues, 2) vague abdominal symptoms or 3) pertinent abdominal symptoms ± "red flags". AL in generalized infection (Ebstein-Barr virus, scrub typhus, COVID-19 etc), multisystemic immunological diseases (systemic lupus erythematosus, Still's disease, post COVID-19 multisystem inflammatory syndrome, Kawasaki disease etc) and local lymph nodes adjacent to local inflammation (cholecystitis, pancreatitis, pancreatitis, mesenteric ischemia etc) do not require further workup. They tend to resolve on recovery of the underlying disease.

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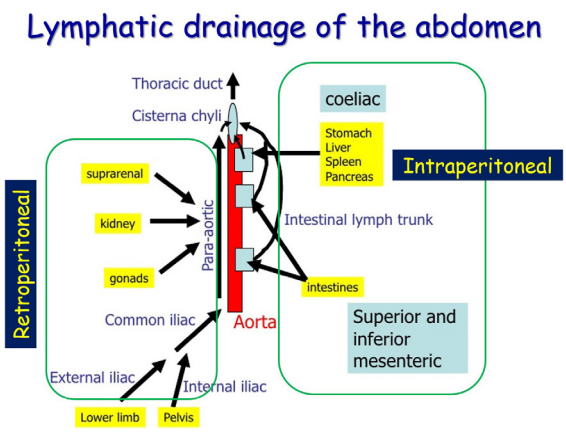
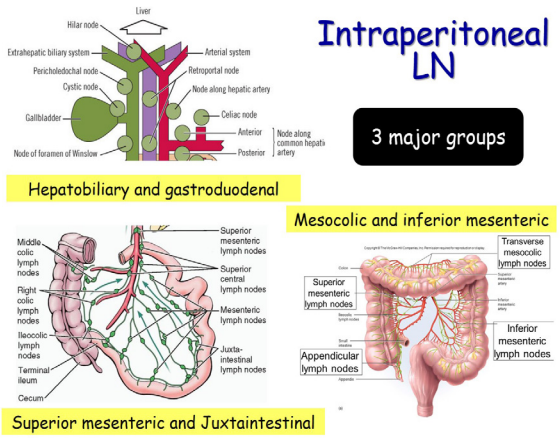
Evaluation of AL is warranted if reported in the following situations.

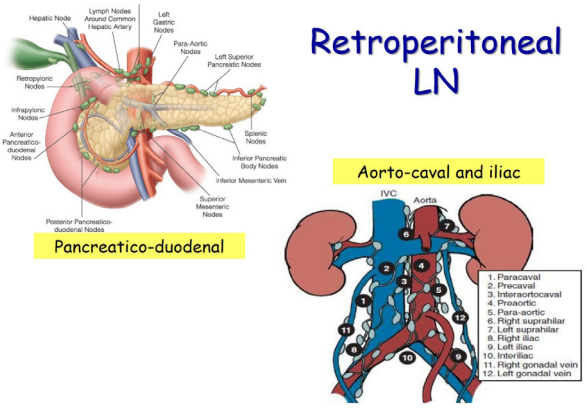
1) **Red flags:** Common red flags are nocturnal symptoms, gastrointestinal bleeding, bilious vomiting, ascites, jaundice, weight loss, growth failure, anorexia, fever, peripheral significant lymphadenopathy or any systemic organ involvement.
2) **Associated pain abdomen:** When the abdomen is divided into the 9 quadrants, any pain which is in the lateral part of the abdomen (either side) is usually organic until proved otherwise. Midline pain (epigastric, periumbilical, hypogastric) may be functional or organic. Hence AL may be incidental in functional abdominal pain, functional dyspepsia and irritable bowel syndrome and does not warrant workup.
3) **Site of lymph nodes:** Fleshy intraperitoneal lymph nodes below superior mesenteric artery (SMA) origin are not worrisome unless other features are present[1]. Nodes above SMA (especially hepato-biliary and gastro-duodenal) without any local pathology or positive red flags need evaluation. Intraperitoneal (± retroperitoneal) AL is expected in abdominal tuberculosis. Hence isolated enlarged retroperitoneal lymph nodes should alarm rather for lymphoma or spinal tuberculosis.
4) **Size of lymph nodes:** Nomograms of AL in children are available[2]. Of all age groups, children aged 7-10 years have the highest dimensions of abdominal nodes. Based on size, AL >10 mm (short axis) and >15 mm (long axis) irrespective of location are considered significant.
5) **4 C's of lymph nodes**: **C**aseation (necrotic), **C**onglomeration, **C**alcification, en**C**asement of vessels. The usual suspicion in the above scenarios are tuberculosis, lymphoma, neoplasms and rarely fungal (histoplasmosis etc).

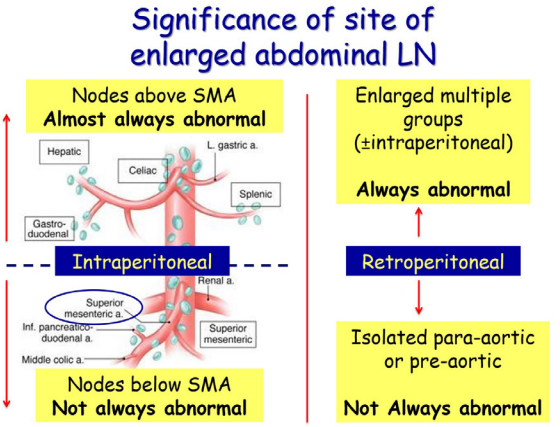
When evaluating for AL, computerised tomography (CT) is the best modality of assessment. In older children, diagnostic endosonography (EUS) can be considered for better delineation of enlarged hepatobiliary, gastroduodenal and peripancreatic lymph nodes. Significant nodes should be sampled by fine-needle aspiration or biopsy by ultrasonography, CT or EUS. Depending on the clinical scenario, tissue sampling should be well planned and sent for

Senior registrar, Department of Pediatric Gastroenterology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Raebareli Road, Lucknow, 226014, India
Email: drneerajkumarrao@gmail.com
Associate Professor, Department of Pediatric Gastroenterology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Raebareli Road, Lucknow, 226014, India
Email: moinaksen@yahoo.com









cytology, histology, mycobacteriology (stain and culture) and mycology (stain and culture). Quick yield is obtained with cartridge-based nucleic acid amplification test/ GeneXpert in suspected tuberculosis and flow-cytometry in suspected lymphomas.

In conclusion, AL should not be interpreted in isolation but in association with the clinical scenario. Incidentally detected discrete mesenteric lymph nodes are like to be healthy than pathological and better left unpursued.

FURTHER READING:

1. Karmazyn B, Werner EA, Rejaie B, Applegate KE. Mesenteric lymph nodes in children: what is normal? *Pediatr Radiol*. 2005 Aug;35(8):774-7. doi: 10.1007/s00247-005-1462-2. Epub 2005 May 10. PMID: 15883829.
2. Spijkers S, Staats JM, Littooij AS, Nievelstein RAJ. Abdominal lymph node size in children at computed tomography. *Pediatr Radiol*. 2020 Aug;50(9):1263-1270. doi: 10.1007/s00247-020-04715-z. Epub 2020 Jun 7. PMID: 32507962; PMCID: PMC7399684.