Hirschsprung’s Disease (HD) - Congenital Megacolon Child Imaging with Low Dose Technology

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Epidemiology

Hirschsprung’s Disease (HD), also known as congenital aganglionic megacolon, is an anomaly characterized by an absence of ganglion cells in the myenteric and submucosal plexuses in a variable length of bowel segment, especially in boys. Hirschsprung disease affects approximately 1:5000-8000 live births. In short segment disease, there is a significant predilection for males which reduces with increasing length of involvement. Interestingly, it is almost never seen in premature infants.

History

A 6-year-old male patient, presented with acute abdominal pain, swelling of the abdomen, vomiting and constipation. He was referred to the radiology department with a clinical suspicion of bowel obstruction. Whole abdomen low dose contrast CT was performed with dedicated child abdomen protocol.

Diagnosis

Whole abdomen low dose multi-phase CT study (total DLP 81 and effective dose 0.5 mSv; gray) performed on the Siemens Healthinners SOMATOM go. Top 128-slice CT scanner, showed a large bowel obstruction ROH Hirschsprung disease. Liver is normal in size and no focal lesions are seen. The large bowel loops are dilated markedly up to the rectosigmoid junction and filled with feces. There is no evidence of mass lesion. Both the kidneys, pancreas and spleen are normal. Urinary bladder is distended and normal in wall thickness.

Conclusion

Low-dose MDCT has a good role in localizing the site of TZ of HD in infants. Low dose technologies like tin filter and low kV imaging facilitate the achievement of the ALARA (as low as reasonably achievable) principle especially in pediatric CT imaging. Iterative reconstruction algorithm SAFIRE helps to reduce noise from low dose imaging and helps to visualize superior image quality in such low dose imaging. Such low dose protocols are important especially in developing countries like Ethiopia where a significant proportion of the population is in the pediatric age group (around 13 million people are under the age of 5 which constitute about 16% of the total population).

References


Examination Protocol

Patient Position FFS
Scanner SOMATOM go. Top 128-slice CT Scanner
Scan area Whole Abdomen
Rotation time 0.3 s
Scan mode Helical
Pitch 1.5
Scan length 368.2 mm
Slice collimation 64 x 0.6 mm
Scan direction Coronal-caudal
Slice width 3 mm
Scan time 3.6 Sec
Reconstruction increment 3 mm
Tube voltage 70 kV
Reconstruction kernel B36
Effective mAs 1.00 mAs
SAFIRE Strength 2
Dose modulation CARE Dose4D and CARE kV
Effective dose 0.73 mSv
DLP 83 mGy.cm

Estimated by applying a conversion factor of 0.020


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