

Efficacy and long term outcome of minimally invasive resection for abdominal neuroblastic tumors

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Questions

- MIS
 - Potential advantages and risks
 - Indications
 - Technique
 - Morbidity

Background

- MIS for abdominal neuroblastic tumors
 - Recent advances in neuroblastomas and ganglioneuromas
 - Maris JM, N Engl J Med 2010;362:2202-11
 - Retrosi G et al, Eur J Pediatr Surg 2011;21:33-7
 - Brisse H et al, Radiology 2011, 261:243-57
 - Laparoscopic adrenalectomy
 - Mirallie E et al, Surg Endosc 2001;15:156-160
 - Leclair MD et al, Ann Surg Oncol 2008;15:117-24
 - Heloury Y et al, J Pediatr Surg 2011, accepted for publication

Questions

- MIS for abdominal neuroblastic tumors
 - Potential advantages and risks
 - Indications
 - Technique
 - Morbidity
 - Oncological result (local recurrence)

Material and methods

- Retrospective study (1988-2010)
- 2 centers (Nantes, Melbourne)
- Neuroblastic abdominal tumors (ganglioneuromas and neuroblastomas) resected by MIS
- Follow-up longer than 12 months
- Criteria: local recurrence

Results

- 31 cases (1998-2011) 154 neuroblastic tumors
 - 26 FU longer than 12 months
- Median age: 34 months (2-155)
 - 6 < 18 months
 - 3 Prenatal
- Stage
 - LI: 14
 - M: 8
 - Ms: 4
- Size: 40 mm (20-110)



Results

- **Technique**
 - Lateral transperitoneal: 23
 - Prone retroperitoneal: 3
- **Duration: 70 min (40-200)**
- **Conversion: 0**
- **Associated procedures: 7**
 - ovarian cryopreservation: 2
 - liver biopsy: 2
 - fundoplication: 1
 - gastrostomy: 1
 - closure of colostomy (cloaca): 1
- **Postoperative complication: 1 intestinal obstruction (3 mm port)**



Results

- Quality of resection
 - Macroscopic: 26
 - Microscopic: 17 (65%)
- Histology
 - 21 neuroblastomas
 - 5 ganglioneuromas
- MYCN amplification: 2 (M)

Results

- Follow-up: 66 months (4-120)
- LI: 14
 - 9 neuroblastomas; 5 ganglioneuromas
 - EFS: 100%
- M: 8
 - No local recurrence
 - Death: 3 (1/3MYC-N amplified) recurrence or progression of metastasis
 - 5 EFS
- MS: 4
 - 1 death: metastatic recurrence at 20 months (secondary MYCN amplification)
 - 3 EFS

Discussion

- Potential advantages

- Pain

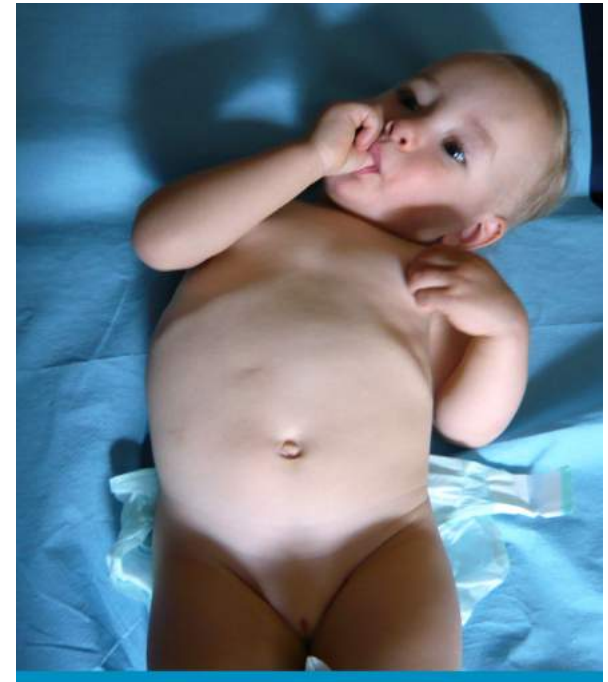
- Appendicitis (Lejus C et al, Anesthesiology,1996;84:801-6)
 - Pyloric stenosis (Leclair MD et al, J Pediatr surg, 2007;42:692-8)

RCT: no difference for limited procedures

- Intestinal obstruction

- 3.7% after open surgery for tumors (Aguayo P et al, Eur J Pediatr Surg 2010;20:234-6)
 - 0.89% after laparoscopy (Molinaro F et al, Eur J Pediatr Surg 2009;19:160-2)

- Scars

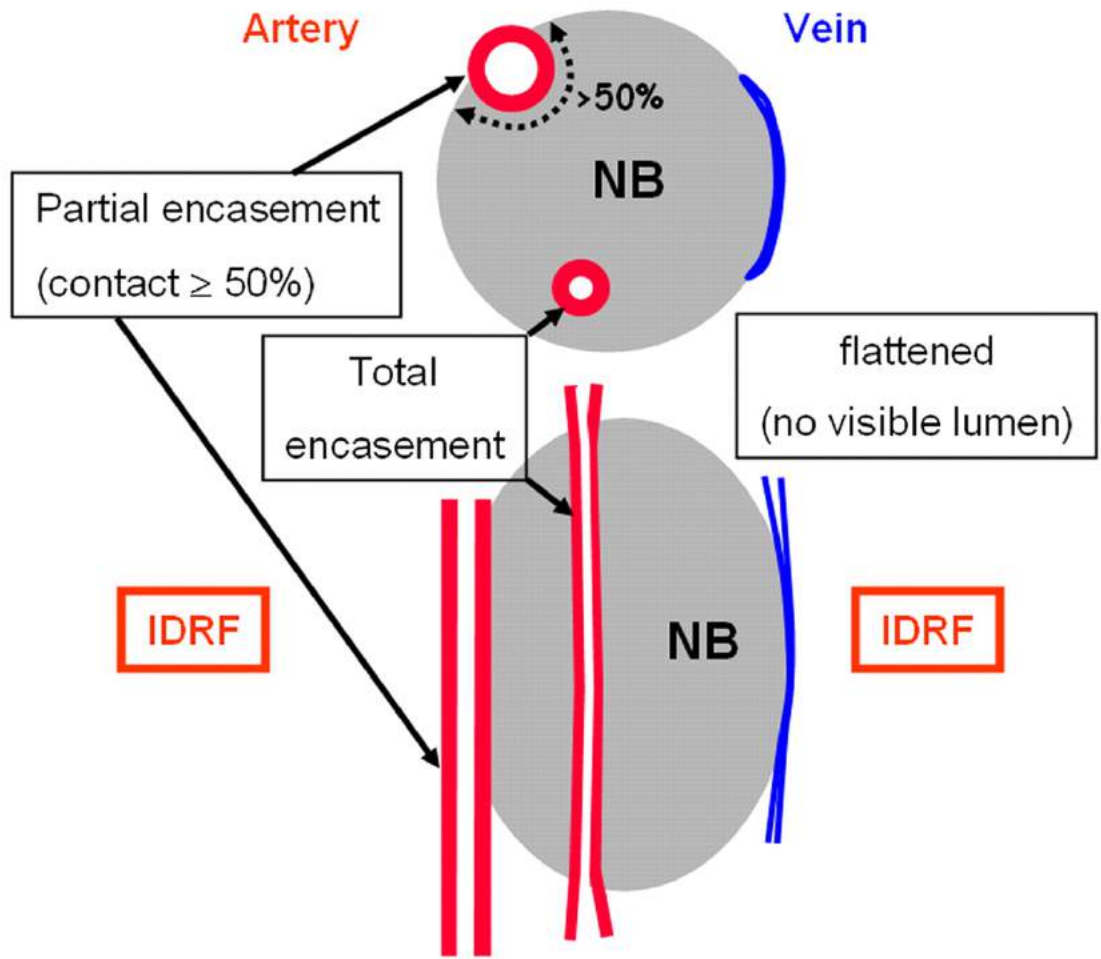


Discussion

- Morbidity: minimal in a very selected population (20%)
- Oncological result
 - No local or port site recurrence
 - In stage M, MIS can help to keep the pace of treatment (high dose chemotherapy with autologous stem cell support)

Discussion

- Indications
 - Surgery is the cornerstone of the treatment of localized NB
 - Surgery is controversial in
 - metastatic NB (CR or VGPR of metastasis)
 - Infants with prenatal or incidental diagnosis
 - Laparoscopy for tumors without Image Defined Risks Factors (IDRF)



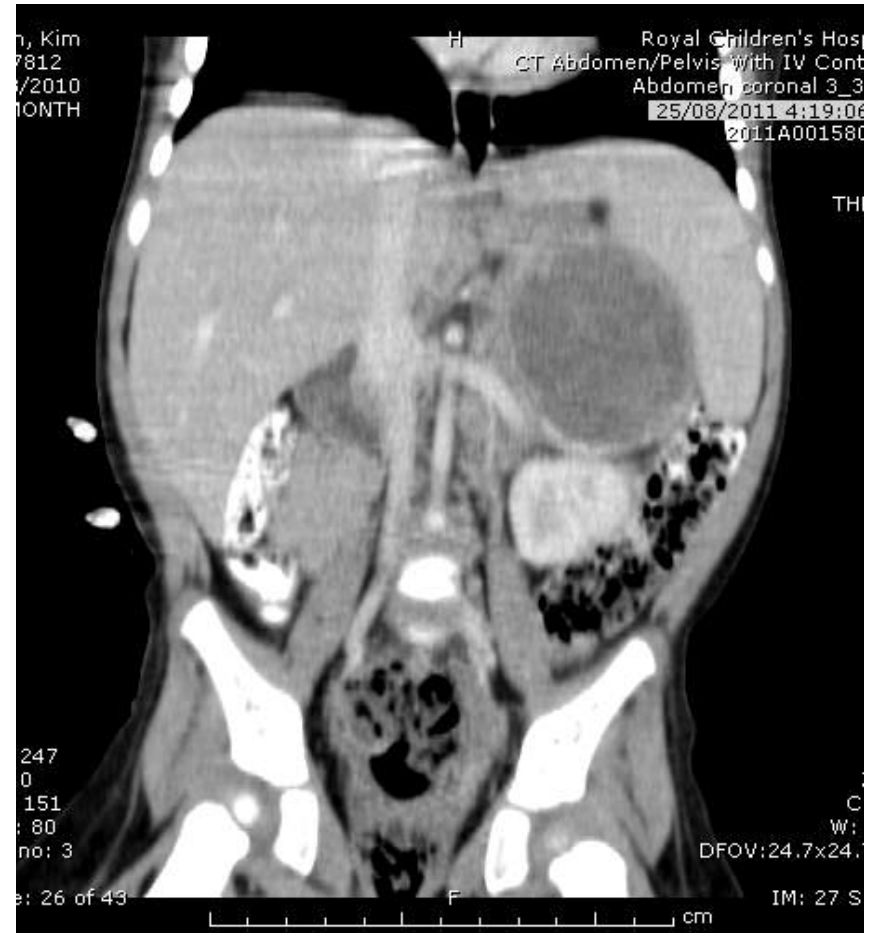
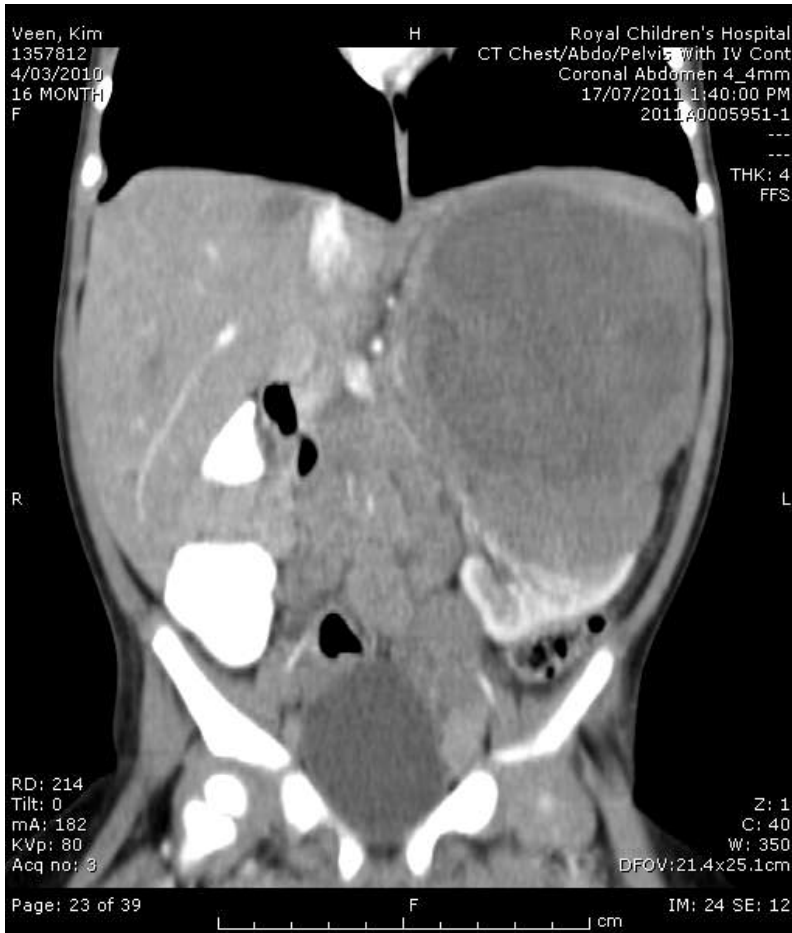
Brisse H J et al. Radiology doi:10.1148/radiol.11101352

Radiology

Discussion

- L1 (no IDRF): MIS except some infants (wait and see policy)
 - Diagnosis
 - Biology (MYC-N, ploidy)
 - Classification and prognosis
- L2 (IDRF) or M
 - core biopsy and neoadjuvant chemotherapy
 - after chemotherapy
 - no IDRF: MIS
 - IDRF: open surgery

Discussion



Discussion

- Limited place of MIS for neuroblastic abdominal tumors
- Careful selection on imaging
- Selected indications: good local control
- No specific morbidity