Mapping relapse and relapse detection of Wilms' tumor

- ***A report from the SIOP Renal Tumor Study Group***

Authors

Jesper Brok[1,2], Marta Lopez[3], Harm V Tinteren[3], Taryn D. Treger[1,4], Rhoikos Furtwängler[5], Norbert Graf[5], Christophe Bergeron[6], M.M. van den Heuvel-Eibrink[7], Beatriz de Camargo[8], Arnauld Verschuur[9], Kathy Pritchard-Jones[1], Oystein Olsen[10], Filippo Spreafico[4]

arnauld

Affiliations:

1: University College Great Ormond Street Institute of Child Health, UCL, United Kingdom.

2: Dept. of Paediatric Oncology and Haematology, Rigshospitalet, Copenhagen, Denmark.

3: Dept Biostatistics, Netherlands Cancer Institute, Amsterdam, the Netherlands

4: Dept. Haematology and Oncology, Cambridge University Hospital, United Kingdom.

5: Dept. Haematology and Oncology, Saarland University Hospital, Homburg, Germany

6: Centre Léon Bérard, Institut d'haematology and d'oncology paediatric , Lyon, France

7: Princess Maxima Center for Pediatric Oncology, Utrecht, the Netherlands

8: Paediatric Haemato-Oncology Program, Research Center, Instituto Nacional do Cancer, Rio de Janeiro, Brazil.

9: Department of Pediatric Hematology and Oncology, Hôpital de la Timone Enfant, 13005 Marseille, France.

10: Dept. Radiology, Great Ormond Street Hospital for children, NHS Foundation Trust, London, United Kingdom

11: Dept. of Hematology and Pediatric Onco-Hematology, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy.

Abstract

Background and objective

Children with Wilms tumor (WT) require regular relapse surveillance, usually with abdominal ultrasound and chest X-ray starting after surgery. We mapped the location, timing and mode of detection of first WT relapse using the SIOP WT 2001 trial database and assessed prognostic factors for post-relapse mortality. Data were used to evaluate current surveillance recommendations.

Methods

All patients with WTs registered (2001 - 2016) in the SIOP 2001 protocol and treated with pre-operative chemotherapy as per protocol were included in the analyses.

Results

Of 4348 registered patients, 538 (12%) relapsed. Relapse site predominantly involved lung (65%) and/or abdomen (49%), less frequently liver (11%), bone (1%) and central nervous system (1%). 5-year survival after relapse was 61% (95% CI: 57%-66%) and 75% of relapses occurred within 2 years post-surgery. Surveillance imaging captured 78% of the relapses and the remaining relapses presented with clinical symptoms 'outside' of routine follow-up. Relapse was identified by abdominal ultrasound (32%), chest X-ray (30%), CT scan of chest/abdomen (23%/7%), abdominal MRI (4%) or other (4%). The majority (69%) of relapses were not detectable by medical examination and only 33% of relapses were accompanied by symptoms. Multivariate analyses found significantly ($P < 0.05$) increased mortality risk after relapse for the following variables; surgery to relapse interval < 6 months, presentation with symptoms 'outside' planned follow-up, higher tumour volume at initial surgery, and advanced stage/histological risk group.

Conclusion

WT relapses predominantly involve the lung and generally occur within 2 years of nephrectomy and without symptoms. Current routine surveillance imaging captured the majority of relapses and these patients had better post-relapse survival. In the absence of prospective trials, the best available evidence indicates that current follow up recommendations are effective and should primarily be focused on the first two years after nephrectomy.