PEDIATRIC UROLOGY

Age at orchiopexy and testis palpability predict germ and Leydig cell loss: clinical predictors of adverse histological features of cryptorchidism

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Purpose: We determined the relationship between clinical variables and testicular histopathological changes associated with decreased fertility potential in children with cryptorchidism.
Materials and Methods: Testis biopsies of 274 children who underwent orchiopexy and concurrent testicular biopsy between 1991 and 2001 were analyzed for germ and Leydig cell loss, and testicular fibrosis. Multivariable logistic regression was used to determine if age at orchiopexy (analyzed as continuous and ordinal variables), preoperative testis palpability, unilateral vs bilateral disease and/or side of undescended testis was predictive of these pathological outcomes.
Results: Age at orchiopexy was associated with germ and Leydig cell depletion. Each month of testis undescent was associated with development of moderate/severe germ cell depletion (OR 1.02 for each month of age, $p < 0.005$) and Leydig cell loss (OR 1.01 for each month of age, $p < 0.02$). Nonpalpable testes were associated with severe germ cell depletion. Children with palpable testes had lower odds of germ cell depletion than those with nonpalpable testes (OR 0.46, $p < 0.005$). This finding corresponds to a significant 2% risk per month of severe germ cell loss and 1% risk per month of Leydig cell depletion for each month a testis remains undescended, and a 50% greater risk of germ cell depletion in nonpalpable relative to palpable cryptorchid testes.
Conclusions: Testes that remain undescended are associated with progressive loss of germ and Leydig cells, and nonpalpable testes predict severe germ cell loss.

Editorial Comment

This is an 11-year study. Patients under 18 underwent orchiopexy with a concurrent testicular biopsy. The pathologic specimens were graded on the degree of tubular fibrosis, average number of germ cells per tubule and presence or absence of Leydig cells. Patients were grouped into 4 groups by age, 0-12 months, 13-24 months, 25-96 months, and greater than 96 months. They also had an ordinal statistical analysis.

Of the 274 patients included in the study, 68% had unilateral cryptorchidism and 32% had bilateral. The mean age was 43.6 months with a range of 1-209 months. 172 of the patients had palpable testes and 102 were non-palpable. Forty-five were intra-abdominal testes. After adjusting for variables, each month of undescended state of the testis was associated with germ cell depletion with an odds risk of 1.02 for each month. The p-value was less than 0.005 and Leydig cell loss had an odds risk ratio of 1.01 for each month with a p-value of 0.02. There was no association found between testis palpability and the absence of Leydig cells. Fibrosis was not associated with testis location or patient age. There was no pathologic correlation associated with laterality or with unilateral bilateral disease.

The results suggest a significant 2% risk per month for germ cell depletion and 1% risk per month for Leydig cell loss after the first year of life, this confirms current practice patterns of suggesting early orchiopexy for the best long-term results. Of note, the patient age in the study was older than usual practice with a mean of 43.6 months. I also wish that the authors and journal had included more data. Since 40% of their patients were younger than 18 months, this means that there was just over 1 patient per month in all of the months studied. It would be helpful to understand the statistics better and the data distribution to be certain that the statistical outcomes are correct.

The greatest concern for papers predicting outcome of undescended testes is that they are just that, predictions. It takes an extremely long study to actually document fertility and paternity and the threshold of Leydig cell depletion which affects adult hormone function is not clear.

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Abnormal renal scans and decreased early resolution of low grade vesicoureteral reflux

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Purpose: Limited studies suggest a relationship between scarring on renal scan and failure to resolve vesicoureteral reflux. We evaluated the impact of abnormal renal scans on early vesicoureteral reflux resolution.
Materials and Methods: The medical records and renal scans were reviewed of children diagnosed with primary reflux between 1988 and 2004. We defined an abnormal renal scan as renal scarring or relative renal function 40% or less. Reflux resolution was noted 1 and 2 years after diagnosis.
Results: Renal scan data were available on 161 children with vesicoureteral reflux, including 127 girls and 34 boys. Relative renal function was 15% or less in 7 children, 16% to 35% in 14, 36% to 40% in 18 and greater than 40% in 122. Of the 161 patients 79 (43%) had an abnormal renal scan, including 37% with grades 1 to 3 reflux. The rate of 2-year reflux resolution in the abnormal and normal renal scan groups was 13% vs 53%. Of children with grades II and III reflux those with an abnormal renal scan were less likely to have reflux resolution compared to those with normal renal scans (23% vs 55% and 4% vs 41, respectively, $p < 0.05$). The same relationship was present at 1 year for grades 2 and 3 (18% vs 49% and 4% vs 30, respectively, $p < 0.05$).
Conclusions: Abnormal renal scans are an important independent predictor of early failure to resolve vesicoureteral reflux. An abnormal renal scan should be considered when counseling families about the likelihood of early reflux resolution. Performing a renal scan may be indicated in select patients.

Editorial Comment

This research deals with 16 years of reflux studies in which patients had a renal scan and a VCUG. Demographic variables as well as voiding dysfunction were noted and compared. One hundred and sixty-one patients had a renal scan and all of the recurred data for the study. Four different kinds of renal scans were used over this long data collection period, including glucoheptonate, Mag3, DMSA and DPTA. Relative renal function was judged to be poor if it were less than 40% and abnormal renal scans were noted if there were renal scars, even if the relative renal function was normal.

Seventy children, 43.5%, had abnormal renal scans and 91 children had normal renal scans. Boys had a few more abnormal renal scans than girls did but this did not reach statistical significance. The incidence of voiding dysfunction between normal and abnormal renal scans was the same. Abnormal renal scans were more prevalent in higher grades of reflux and this reached a p value of less than 0.001. There was not a statistical difference between different kinds of renal scans.

Reflux spontaneous resolution rate was 29.8% at 1 year and 35.4% at 2 years and 33 children in the study group underwent corrective surgery within the first two years. Of the patients with diminished relative