Is staging beneficial for Fowler-Stephens orchiopexy? A systematic review

CRD summary
This review concluded that single-stage and two-stage Fowler-Stephens orchiopexy both had fairly high success rates; two-stage was more successful for treating high undescended testes in a paediatric population. The quality of evidence was low. Due to the low quality of evidence and the lack of detail about the included studies, a note of caution is needed when interpreting this review.

Authors' objectives
To determine whether single or 2-stage Fowler-Stephens orchiopexy results in better testicular viability after surgical treatment of high undescended testes.

Searching
MEDLINE, EMBASE, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL), DARE, Cochrane Database of Systematic Reviews and ACP Journal Club were searched up to February 2009 for studies published in English. Search terms were reported. Reference lists of the selected papers, grey literature, relevant conference proceedings for the previous five years, two clinical trial registries and Proquest (for dissertations) were searched.

Study selection
Randomised controlled trials (RCTs) and non-comparative case series of patients younger than 18 years with an intra-abdominal testis who had undergone open or laparoscopic single or 2-stage Fowler-Stephens orchiopexy were eligible for inclusion. Studies needed to report testicular size, position and perioperative and postoperative complications.

Study abstracts were screened by two reviewers.

Assessment of study quality
Study validity was assessed using a questionnaire developed by the review authors. The questionnaire covered randomisation, reporting of follow-up visits and withdrawals, sample size calculation, reporting of statistical tests, p-values and 95% confidence intervals (CI), the patient population, adequate description of the intervention, reporting of mean time between first and second stages and intraoperative location of the testis, specification of vessel ligation level and reporting of outcomes.

Assessment was performed by two reviewers independently. Disagreements were resolved with assistance from a third reviewer.

Data extraction
Results for success rates (testicular viability based on size and location) and complications were extracted. For studies that reported only one type of procedure, the percentage success rate was extracted. For studies that compared single and two-stage procedures, the odds ratio (OR) was used to compare success rates. Authors were contacted to obtain missing information.

Each reviewer extracted 10 papers. The authors did not report whether duplicate independent data extraction was performed.

Methods of synthesis
Results were pooled in a meta-analysis using random-effects models. Heterogeneity was assessed by visual assessment of forest plots and with the $I^2$ statistic. Publication bias was assessed using a funnel plot.
Results of the review
Sixty-one studies were included (n=not reported). Most studies were cohort studies (n=37) or case series (n=23). There was one non-randomised controlled trial. Nine studies used single-stage Fowler-Stephens orchiopexy, 36 studies used two-stage orchiopexy and 16 used both methods. Most studies reported postoperative follow-up and postoperative testicular viability and/or location. Only four studies reported any statistical analysis.

Pooled success rates were 80% (95% CI 75% to 86%; nine studies, 204 testes) for single-stage procedures and 85% (95% CI 81% to 90%; 36 studies, 751 testes) for two-stage procedures. Heterogeneity was low for single-stage procedures ($I^2=11\%$) and moderate for two-stage procedures ($I^2=43\%$). There was no significant difference between the pooled success rates for laparoscopic and open procedures for either single-stage or two-stage Fowler-Stephens orchiopexy.

For the sixteen studies that compared the two types of procedures, there were 232 testes managed by single-stage and 218 by two-stage procedures. The pooled odds ratio was 2.0 (95% CI 1.1 to 3.9) and favoured two-stage. Heterogeneity was ($I^2=16\%$).

Complications were reported by one study of single-stage and 22 studies of two-stage procedures. No complications were reported for single-stage procedures. Ileus, haematoma and infection were the most common complications associated with two-stage procedures.

There was no evidence of publication bias from the studies that compared single-stage and two-stage procedures.

Authors’ conclusions
Both single-stage and two-stage Fowler-Stephens orchiopexy had fairly high success rates; the two-stage method had a higher success rate defined as postoperative viability of the testis. There was no difference between laparoscopic and open techniques. The quality of the evidence was low and a better-designed study was needed.

CRD commentary
This review had a clear research question and specified inclusion criteria for study design, interventions, participants and outcomes. The search was wide and covered unpublished literature. The restriction to studies published in English was a potential source of bias. It appeared that most steps of the review were performed by two reviewers, but it was unclear whether data were extracted in this way. Study validity was assessed, but this was reported only as an overall summary and no details of the individual studies or their quality were given. This made it difficult to judge the quality and generalisability of the evidence. The quality of the evidence was low as there were no randomised controlled trials and most studies were retrospective cohort studies or case series.

Due to the low quality of evidence and the lack of detail about the included studies, a note of caution is needed when interpreting this review.

Implications of the review for practice and research
**Practice:** The authors did not make any recommendations for practice.

**Research:** The authors stated that a randomised controlled trial was needed to compare single-stage and 2-stage Fowler-Stephens orchiopexy in the paediatric population.

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Not stated.

Bibliographic details
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.