

# Algorithm for optimal urethral coverage in hypospadias and fistula repair: a systematic review

## ABSTRACT

**Context:** Although urethral covering during hypospadias repair minimizes the incidence of fistula, wide variation in results among surgeons has been reported.

**Objective:** To investigate what type of flap used during Snodgrass or fistula repair reduces the incidence of fistula occurrence.

**Evidence acquisition:** We systematically reviewed published results for urethral covering during Snodgrass and fistula repair procedures. An initial online search detected 1740 reports. After exclusion of ineligible studies at two stages, we included all patients with clear data on the covering technique used (dartos fascia [DF] vs tunica vaginalis flap [TVF]) and the incidence of postoperative fistula.

**Evidence synthesis;** A total of 51 reports were identified involving 4550 patients, including 33 series on DF use, 11 series on TVF use, and seven retrospective comparative studies. For distal hypospadias, double-layer DF had the lowest rate of fistula incidence when compared to single-layer DF (5/855 [0.6%] vs 156/3077 [5.1%];  $p = 0.004$ ) and TVF (5/244, 2.0%), while the incidence was highest for single-layer DF among proximal hypospadias cases (9/102, 8.8%). Among repeat cases, fistula incidence was significantly lower for TVF (3/47, 6.4%) than for DF (26/140, 18.6%;  $p = 0.020$ ). Among patients with fistula after primary repair, the incidence of recurrence was 12.2% (11/90) after DF and 5.1% (5/97) after TVF ( $p = 0.39$ ). The absence of a minimum follow-up time and the lack of information regarding skin complications and rates of urethral stricture are limitations of this study.

**Conclusion:** A double DF during tubularized incised plate urethroplasty should be considered for all patients with distal hypospadias. In proximal, repeat, and fistula repair cases, TVF should be the first choice. On the basis of these findings, we propose an evidence-based algorithm for surgeons who are still in their learning phase or want to improve their results.

**Patient summary:** We systematically reviewed the impact of urethral covering in reducing fistula formation after hypospadias repair. We propose an algorithm that might help to maximize success rates for tubularized incised plate urethroplasty.

**Keyword:** Hypospadias; Urethroplasty; Dartos fascia; Tunica vaginalis; Urethrocutaneous fistula; Snodgrass