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Timing Matters : Impact of delay to first balloon dilation on outcomes of pediatric caustic esophageal strictures

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Introduction

Caustic esophageal strictures are a serious complication in children after corrosive ingestion. Endoscopic balloon dilation is the standard treatment, but the optimal timing for the first dilation remains unclear.

To evaluate whether the interval between ingestion and first dilation affects the risk of dilation failure and esophageal perforation.

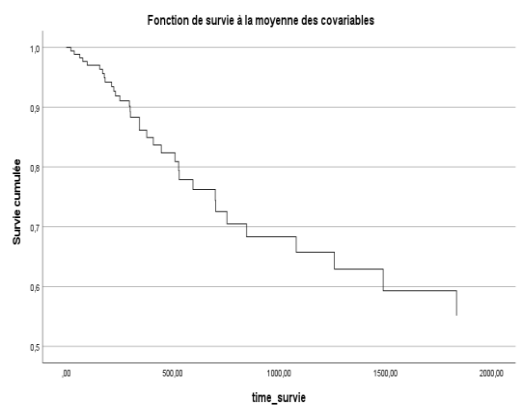
Material and methods

- Retrospective study
- Pediatric patients treated for caustic esophageal strictures from 2004 to 2024.
- Data included demographics, stricture characteristics, timing of first dilation, and outcomes (failure, perforation).
- Patients were grouped by time intervals (≤30 vs. >30 days; ≤60 vs. >60 days).
- Outcomes were analyzed using Kaplan-Meier curves and Cox regression ($p < 0.05$).

Results

- 144 patients were included, 52,1% were male, 53,5% were aged above 3 years with
- Kaplan-Meier survival analysis showed that the timing of the first dilation after caustic ingestion significantly affected outcomes.

- Patients dilated **after 60 days** showed a mean time to failure of 1416 days versus 30 days for earlier dilation ($p < 0.001$), ➔ This means that a longer delay before the first dilation is associated with a lower risk of failure (better survival or longer event-free time).
- Cox regression confirmed that each additional day of delay reduced the risk of failure (HR=0.995, 95% CI [0.990–1.000], p=0.040).
- Age, weight, and number of strictures were not significant predictors.
- However, **early dilation** was linked to **earlier perforation occurrence (mean 30 vs. 1167 days, $p < 0.001$).**



Conclusion

The timing of the first dilation is the only significant predictor of outcome.
Delaying the first balloon dilation beyond 30 days post-ingestion reduces the risk of treatment failure and perforation, likely by avoiding the fragile inflammatory phase, supporting a delayed, individualized approach in managing pediatric caustic esophageal strictures.