

# Paraesophageal Hernia Repair: why complete resection of the hernia sac matters.

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## INTRODUCTION

Paraesophageal hernias (PEH) represents only 5% of all hiatal hernias (HH). Laparoscopic PEH repair is effective and indicated in symptomatic patients. However, 3–10% of patients will eventually require redo-surgery for recurrence. Basic technical steps in PEH are fundamental in order to prevent a recurrence; this concept entails sac excision, stomach reduction, elimination of axial and radial tensions to assure adequate intrabdominal esophageal length, and hiatus repair.

## AIM

This study aims to identify the surgical technical mistakes that are associated with recurrence in patients referred for redo PEH operations in our tertiary care center.

## METHOD

After ethical board approval of the Digestive and Endocrine of the Hôpitaux Universitaires of Strasbourg, France a retrospective review of a prospective database of gastro-esophageal junction surgery was performed over the last 3 years. All patients who underwent to laparoscopic hernia repair were included, patients’ demographics, type of primary surgery, time to recurrence, findings at the redo-surgery and outcomes were retrieved and analyzed.

The statistical analyses was carried out by using IBM SPSS® software v24, continuous study variables were presented as mean and standard deviation and differences between groups were evaluated using . All p-values were calculated using 2-sided tests and were considered statistically significant at level <0.05.

## RESULTS

Twenty-four patients were operated for a recurrence or a de-novo hiatal hernia after hiatal surgery in the study period analyzed. The mean time to performed Redo-surgeries after the primary procedure was 94.58 months, mean operative time was 142.71 minutes SD 105.4 minutes. PEH was the leading indication of redo-surgery in 9 patients (41,7%) (**Table 1**).

Subanalysis

In the PEH recurrence group, the meantime to recurrence was 56,66 months. In this group, the most common intraoperative finding was the presence of a complete or partial hernia sac (66%). Patients in whom the hernia sac was not resected during the first operation showed a statistically significant difference in time of recurrence (23 vs. 174.5 months; p<0.05) and perioperative complications (2 vs. 0; p<0.05) compared to the group of redo-surgery for PEH without residual hernia sac (**Table 2**)

TABLE 1

| Variable                           |        |                          |
|------------------------------------|--------|--------------------------|
| Gender M                           | 10     | 41.7%                    |
| Gender F                           | 14     | 58.3%                    |
| Age                                | 56.13  | SD 14.38                 |
| GERD                               | 15     | 62.5%                    |
| Indication for surgery PEH         | 10     | 41.7%                    |
| HH                                 | 7      | 29.2%                    |
| GERD                               | 6      | 25.0%                    |
| Achalasia                          | 1      | 4.2%                     |
| First Type of Surgery Nissen       | 19     | 79.2%                    |
| Nissen + Prosthesis                | 3      | 12.5%                    |
| Other                              | 2      | 8.3%                     |
| Recurrence (months)                | 94.58  | SD 94.97 Min 1 Max 352   |
| Redo Indication PEH                | 9      | 37.5%                    |
| HH                                 | 10     | 41.7%                    |
| GERD                               | 5      | 20.8%                    |
| Redo type of surgery Nissen        | 12     | 50%                      |
| Nissen + Prothesis                 | 12     | 50%                      |
| Another associate procedure Collis | 1      | 4.2%                     |
| Redo Time (minutes)                | 142.71 | SD 105.84 Min 75 Max 300 |
| Redo Complication                  | 2      | 8.3%                     |
| Presence of Hernia Sac             | 6      | 25%                      |

TABLE 2

| Variable                            | Redo PEH (n=9) | Redo (n=15)      | p value  |
|-------------------------------------|----------------|------------------|----------|
| Sex                                 |                |                  |          |
| M                                   | 5 (55.6%)      | 5 (33.3%)        |          |
| F                                   | 4 (44.4%)      | 10 (66.7%)       |          |
| Age                                 | 63.63 (SD 8.8) | 52.38 (SD 15.03) |          |
| GERD                                | 3 (33.3%)      | 12 (80%)         |          |
| First surgery indication PEH        | 9 (100%)       | 1 (6.7%)         |          |
| HH                                  | 0              | 7 (46.7%)        |          |
| GERD                                | 0              | 6 (40%)          |          |
| Achalasia                           | 0              | 1 (6.6%)         |          |
| First type of surgery Nissen        | 6 (66.7%)      | 13 (86.7%)       |          |
| Nissen + Prothesis                  | 2 (22.2%)      | 1 (6.6%)         |          |
| Other                               | 1 (11.1%)      | 1 (6.6%)         |          |
| Recurrence(months)                  | 56.66          | 118.20           |          |
| Redo Indication PEH                 | 9 (100%)       | 0                |          |
| HH                                  | 0              | 10 (66.7%)       |          |
| GERD                                | 0              | 5 (33.3%)        |          |
| Redo Type of Surgery Nissen         | 6 (66.7%)      | 6 (40%)          |          |
| Nissen+prothesis                    | 2 (22.2%)      | 9 (60%)          |          |
| Other                               | 1 (11.1%)      | 0                |          |
| Another associated procedure Collis | 1 (11.1%)      | 0                |          |
| Redo time (minutes)                 | 220 (159.105)  | 100.94(21.92)    | p < 0.05 |
| Redo complication                   | 2(22.2%)       | 0                |          |
| Presence of hernia sac              | 6 (66.7%)      | 0                |          |

Table 1. Descriptive analysis in patients with Redo Surgery  
Table 2. Subanalysis of patients with paraesophageal hernia  
GERD. Gastroesophageal reflux disease PEH. Paraesophageal hiatal hernia HH. Hiatal Hernia

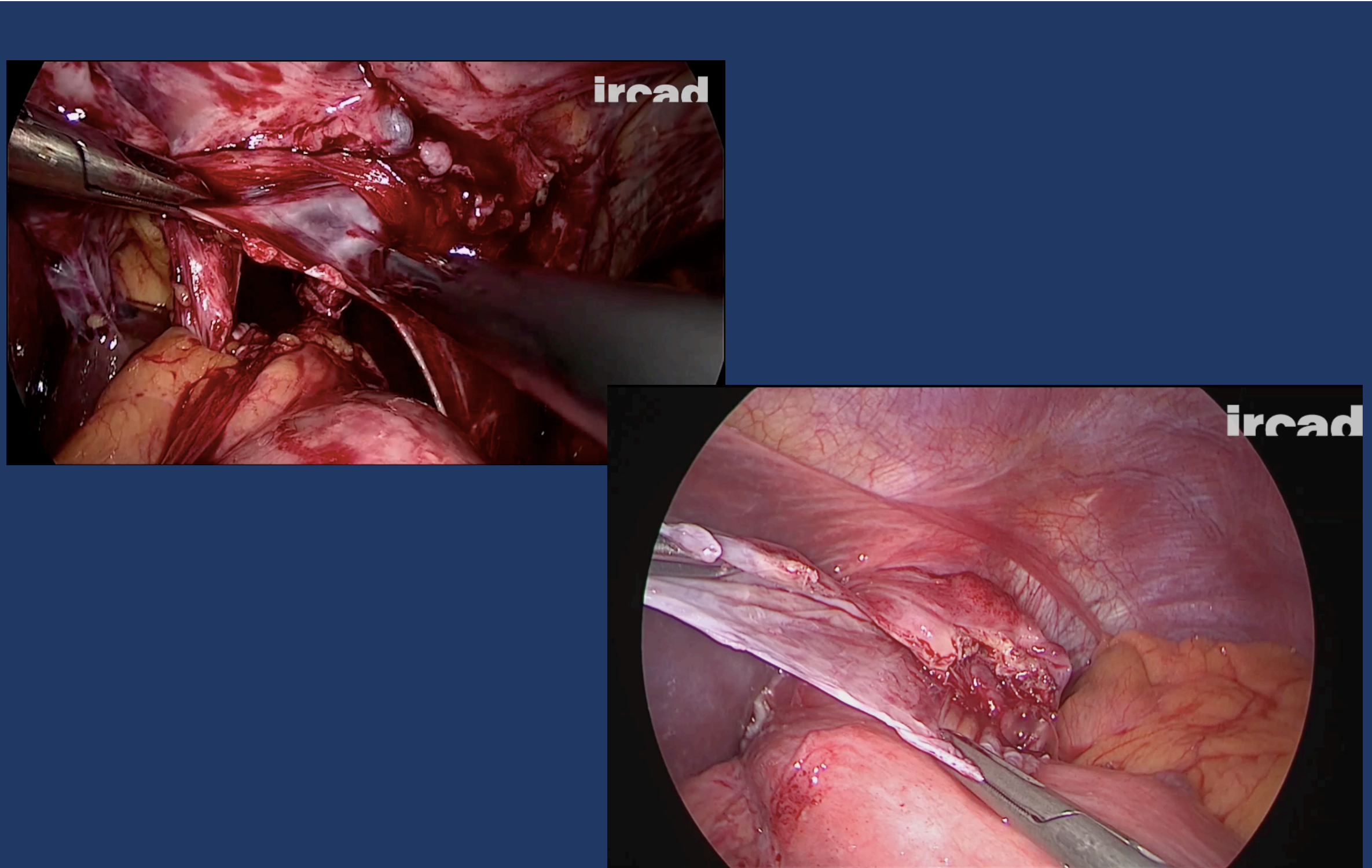


Image 1. Presence of residual sac

## CONCLUSIONS

Our present study found that failure to resect the hernia sac is a surgical technical mistake closely related to PEH recurrence, previously reported trials also considered it as a leading factor.

In our experience, the hernia sac leads to a faster recurrence, longer operative time, and a higher incidence of complications at the time of the redo-surgery.

Technical skills in laparoscopic PEH are essential for good outcomes; hernia sac resection remains to be a fundamental step during surgical repair in this population

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