

ACQUIRED INGUINAL HERNIAS IN HORSES:

A RETROSPECTIVE MULTICENTER STUDY OF 48 CASES RECORDED BETWEEN 2005 AND 2010

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INTRODUCTION

- AIH = **uncommon condition** → 0.08 – 2.8% of total cases of colic
- Rarely occur in **gelding** and described only once in a **mare**
- Usually **Indirect** inguinal hernia, **unilateral** and **strangulated**

Nonsurgical reduction of AIH:

- **External scrotal massage** (under general anesthesia or standing)
- **Traction** of the intestine per rectum (+ **external manipulation** of the scrotum)

Surgical reduction of AIH:

- **Inguinal approach**
 - **Ventral midline celiotomy**
 - **Laparoscopy**
- Usually combination of both

INTRODUCTION



Prevention of recurrence

- **Castration** during the herniorrhaphy
- Partial suture of the superficial inguinal ring around the spermatic cord } Salvaging the testis

Different minimally invasive surgical techniques by laparoscopy:

- Direct intracorporeal suture of the internal ring
 - Barbed suture of the internal ring
 - Transabdominal retroperitoneal mesh insertion technique
 - Cylindrical polypropylene mesh into the inguinal canal
 - Laparoscopic peritoneal flap hernioplasty (LPFH)
- } Salvaging the testis

OBJECTIVES

- To evaluate occurrence, historical data, clinical signs, methods of repair, surgical findings, and postsurgical complications for AIH in adult horses
- To determine variables associated with short-term survival

MATERIALS AND METHODS

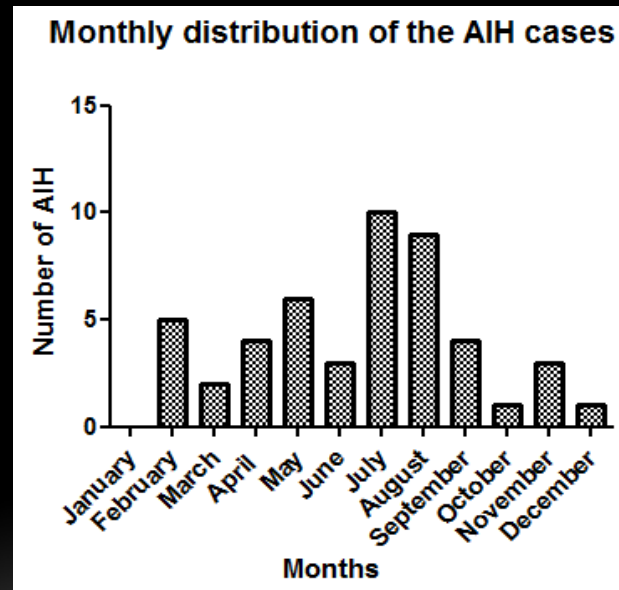
6 years study

4 European equine referral hospitals (England, Ireland, Belgium, and France)

47 adult horses (older than 1 year) → **48 AIH cases**

RESULTS

- **AIH incidence: 1.01%**
Inguinal herniorrhaphy: 2.12% of colic surgically treated
- 75.0% occurred in **summer season** (between April and September)



RESULTS

48 AIH cases: 43 stallions, 4 geldings, and 1 mare

History

Duration of the colic signs before admission: 9.9 ± 7.7 hours

Admission

100% detected at external palpation of the scrotum

71.1% detected at rectal palpation of the deep inguinal ring

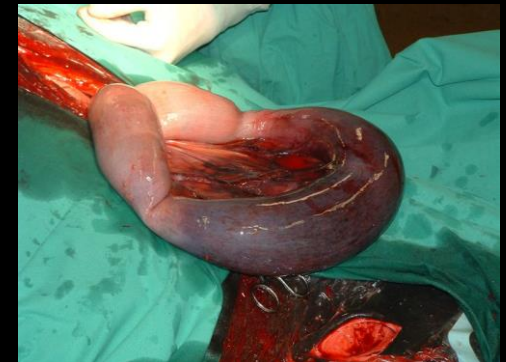
15% had nasogastric reflux



RESULTS

Treatments

- 48 cases {
- 2 horses survived **without surgery**: 1 spontaneous reduction
1 reduction by scrotal manipulation
 - 6 horses **euthanized** shortly after admission
 - 40 horses underwent **surgery** (83.3 %)



Comment: **Manual reduction** in 9 cases (5+, 4-)

RESULTS

Surgery treatment



Median laparotomy + inguinal or scrotal approaches → Technique chosen in 62.5%

Castration → Technique chosen in 88.2% to prevent the recurrence in stallions

Irreversible SI lesions: 16/40 (40.0%)

- Resection and anastomosis: 10/16, 6 cases survived

Concurrent lesions were identified during surgery or necropsy in 25 cases (52.1%)

→ 10 cases: **SI volvulus**

RESULTS

Postoperative complications: 79.4%

- **Paralytic ileus:** 63.0% (> Colic 55.6%)
- **Second emergency surgery:** 6 cases
- **Recurrence hernia same side:** 4 cases
 - 2 after a previous bilateral LPFH, 3 and 7 months before admission
 - 2 within 36 hours following the herniorrhaphy and bilateral castration
- **Complications resulted in death:** 9 horses
- 73.5% of the horses that recovered from surgery were discharged

RESULTS

Indirect inguinal hernia: 43/48 → 89.6%
Inguinal rupture (Direct): 3
Ruptured inguinal hernia: 2

Unilateral 100%
Strangulated 90%
Left (60.9%) > right (39.1%)
Jejunum (52.6%) > ileum (42.1%) > both (5.3%)

Short-term survival rate: 56.3%

RESULTS

Survivors ↔ Nonsurvivors

Table 1. Descriptive Statistics for Variables Significantly Associated with Survival in 48 Cases of Acquired Inguinal Herniation.

Variables	Number of Survivors in which Variable Recorded	Percentage (%) of Survivors	Number of Non-survivors in which Variable Recorded	Percentage (%) of Non-survivors	Survival Rate (%)	P-value
Duration of colic signs before admission						.0144
< 10 hours	20	80.0	9	42.9	69.0	
≥ 10 hours	5	20.0	12	57.1	29.4	
Heart rate						.0185
< 60 bpm	20	74.1	8	38.1	71.4	
≥ 60 bpm	7	25.9	13	61.9	35.0	
Viability of the SI loop involved in the hernia on surgery						.0180
Reversible	19	76.0	5	33.3	79.2	
Irreversible	6	24.0	10	66.7	37.5	
Days of hospitalization						<.0001
1 – 3 days	1	3.7	15	71.4	6.3	
4 – 37 days	26	96.3	6	28.6	81.3	

Variables with a P-value of < .05 are listed.

DISCUSSION



- Most of the AIH cases occurred in **summer**
- **Geldings** more affected than in previous study (van der Velden, 1988)
- Second report of an inguinal rupture in a **mare** (Umstead et al., 1986)
- Slightly more on the **left** side: (Schneider et al., 1982, Wilderjans et al., 2012)
- Combined external inguino-scrotal palpation + rectal palpation
→ 100% AIH diagnosis

DISCUSSION

- **Inguinal approach + ventral midline celiotomy** for herniorrhaphy
 - **Castration** to prevent recurrence
- } Remain techniques the most used clinically
- 20.8% of horses with AIH had **concurrent SI volvulus !**
 - 80% of them arrived after 6 hours
 - SI volvulus may develop secondary to an AIH (Moll et al., 1991)
 - Importance of exploration of the abdomen
 - **Postoperative complications** were common! $\approx 75\%$
 - More than previous study 23.8% (Gluntz et al., 1998)
 - AIH cases had a high risk of undergoing a **second surgery** (Munoz et al., 2008)

DISCUSSION

- **2 cases recurred** after incomplete ring closure by LPFH technique
 - Before the modification of the technique
 - Technique has been modified by Wilderjans et al. (2012)
- Our **short-term survival rate** (56.3%) lower than reported
 - 66.7% (Weaver, 1987) – 74.1% (Schneider et al., 1982).
 - High postoperative complications rate → euthanasia of 9 horses

CONCLUSION

- The survival prognosis depends on:
 - ◇ Duration of the signs prior to admission
 - within 10 hours: good prognosis \approx 70%
 - after 10 hours: poor prognosis \approx 30%
 - ◇ Heart rate on admission
 - ◇ Viability of the herniated SI on surgery
- SI Volvulus secondary to AIH \rightarrow Laparotomy

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Thanks for your attention!

Questions ?