

PRESENTATION SUMMARY & POWERPOINT

Incontinence in Spayed Bitches: Frequency, Causes & Therapy

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Urinary incontinence (UI) is the involuntary loss of urine. UI rarely occurs in sexually intact bitches (0-1%)¹, whereas in spayed bitches the incidence is up to 20%². The underlying pathophysiological mechanism is a reduced closure pressure of the urethra after spaying³.

The causal relationship between the removal of the ovaries and UI has been clearly demonstrated⁴. However, it is still unclear what mechanism triggers UI after spaying. An oestrogen deficiency was initially considered to be the underlying cause⁵. This hypothesis is however contradicted by several observations. For example, bitches treated with depot preparations of gestagens, to suppress oestrus, do not have an increased risk of UI, even though the treatment results in ovarian atrophy⁶ and the oestrogen remains in a basal level⁷.

Another side effect of spaying is the increase in plasma gonadotropins, due to the lack of the ovarian negative feedback⁸. About 42 weeks after ovariectomy the gonadotropin levels reach a plateau, when the plasma FSH is 17 times and the plasma LH is 8 times the initial concentration⁹. One could therefore ask if it is the elevated plasma level of FSH and LH that are responsible for the increased risk of UI in spayed bitches. If this were correct, then affected bitches could be successfully treated with depot preparations of GnRH-analogues, through down-regulation of GnRH-receptors in the pituitary and this in turn will decrease the plasma gonadotropin concentrations. Indeed, 7 of 13 bitches affected by UI were successfully treated with an injection of depot preparations of GnRH-analogues and remained continent for an average of 247 days¹⁰. However, it is questionable whether the success of this treatment is due to a decrease in gonadotropins since their blood levels in responders and non-responders are not different¹¹. It is possible that GnRH has a direct effect on the lower urinary tract, but the success of the therapy is not based on a normalisation of the urethral sphincter incompetence after spaying¹¹. Recent studies in beagle bitches have given rise to the assumption that GnRH modulates the function of the bladder¹².

The treatment of incontinent bitches with GnRH-analogues is mainly interesting for the clarification of the pathophysiological mechanism. For patients affected by UI, the therapy of first choice is with alpha-adrenergica (Phenylpropanolamine / Ephedrine). This results in an increased urethral closure pressure and continence in more than 90% of cases.

If the therapeutic effect is insufficient, then alpha-adrenergica may be combined with oestrogen or Flavoxatum. In refractory cases, several surgical methods are described of

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which colposuspension¹³, urethropexy¹⁴ and the endoscopic injection of collagen¹⁵ are most common and have a success rate of 50 - 75%.

References

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3. Rosin and Barsanti (1981) *JAVMA* 178:814-822.
4. Thrusfield (1985) *Vet Rec* 116:695.
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6. El Etreby (1979) *Cell Tissue Res* 200:229-243.
7. De Bosschere et al. (2002) *Theriogenology* 58:1209-1217.
8. Olson, Mulnix and Nett (1992) *Am J Vet Res* 53:762-766.
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10. Reichler et al. (2003) *Theriogenology* 60:1207-1216.
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13. Holt, *J Small Anim Pract* 26:237-246, 1985.
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Incontinence: Frequency, Causes and Therapy

By Dr. Iris Reichler

Urinary Incontinence (UI) in spayed bitches: frequency, causes, therapy



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UI in adult spayed bitches



- Neurogenic
- Non-neurogenic
 - USMI
 - Ureterovaginal fistula
 - Urovagina
 - Ectopic ureter
 - Tumor
 - Cystitis


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UI in adult spayed bitches

- Neurogenic
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A lateral radiograph of a bitch's pelvic region, showing the bladder and surrounding structures. The bladder is the large, rounded, white structure in the center. The ureters and other pelvic organs are visible as smaller, less dense structures.

Spaying - UI

- Interval between spaying and UI
 - Immediately: 10 years
 - Mean 2.9 years post-op
 - 75 % of the cases within 3 years

Richter 1985, Holt 1985, Arnold 1989

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Spaying - UI

- Interval:
 - Immediately: 10 years
- Incidence:
 - Spayed bitches 3% – 21%
 - Intact bitches 0.2 – 2.1%

Joshua 1965
BSAVA 1975
Krawiec 1989
Ruckstuhl 1978
Osborne 1980
Okkens 1981
Arthur 1981
Thrusfield 1985
Arbeiter 1986
Arnold 1989
Holt 1993
Blendinger 1995
Kyles 1996
Angioletti 2004
Reichler 2005
Goethelm 2006

Spaying - UI

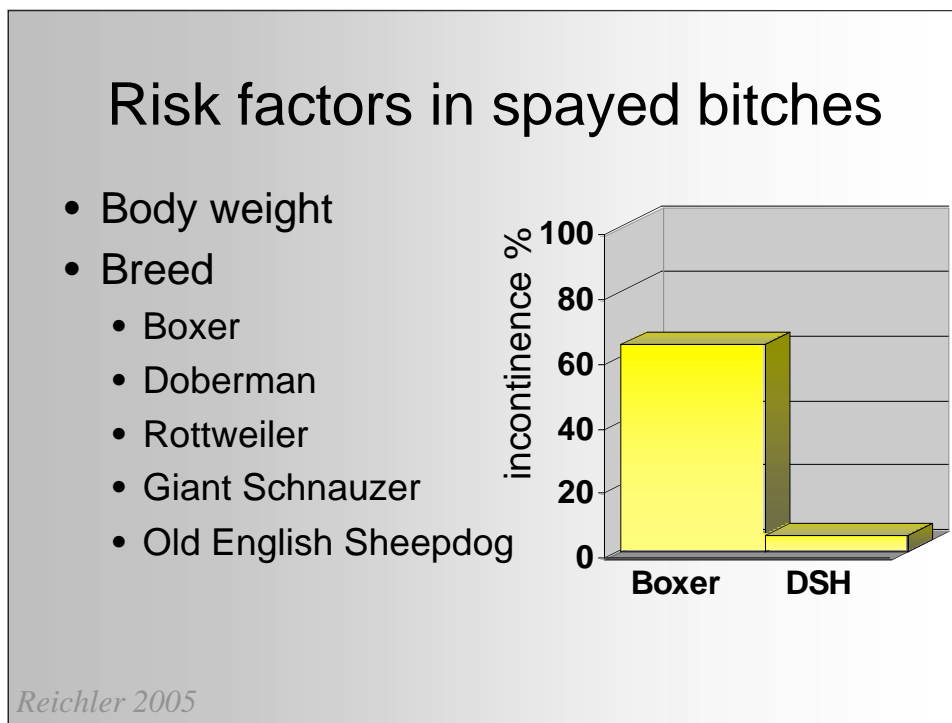
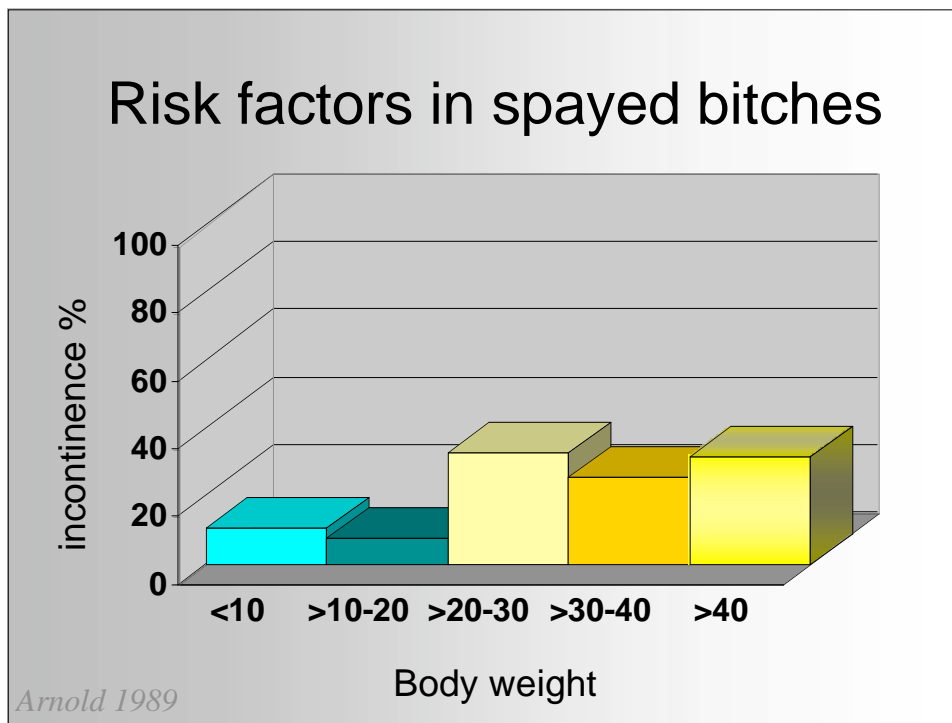
- Interval:
 - Immediately: 10 years
- Incidence:
 - Spayed bitches 3% – 21%
 - Risk factors
 - Body weight, breed
 - Time of spaying

Ruckstuhl 1978, Arbeiter 1986, Arnold 1989, Holt 1993, Blendinger 1995, Nickel 1998, Thrusfield 1998, Stöcklin-Gautschi 2001, Angioletti 2004, Reichler 2005, Goethelm 2006

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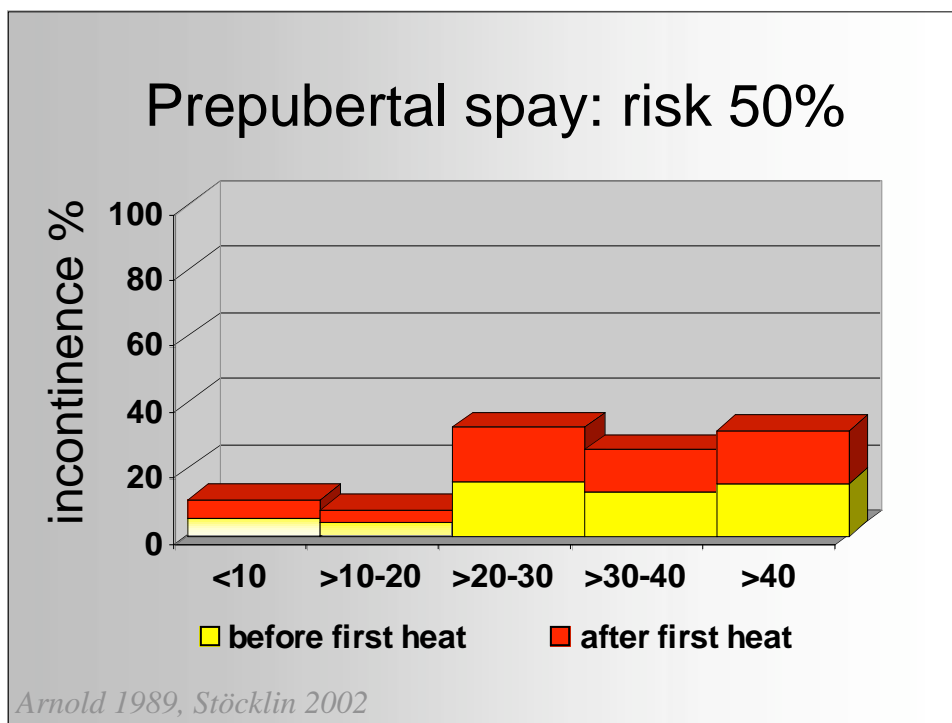
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Urethral closure pressure

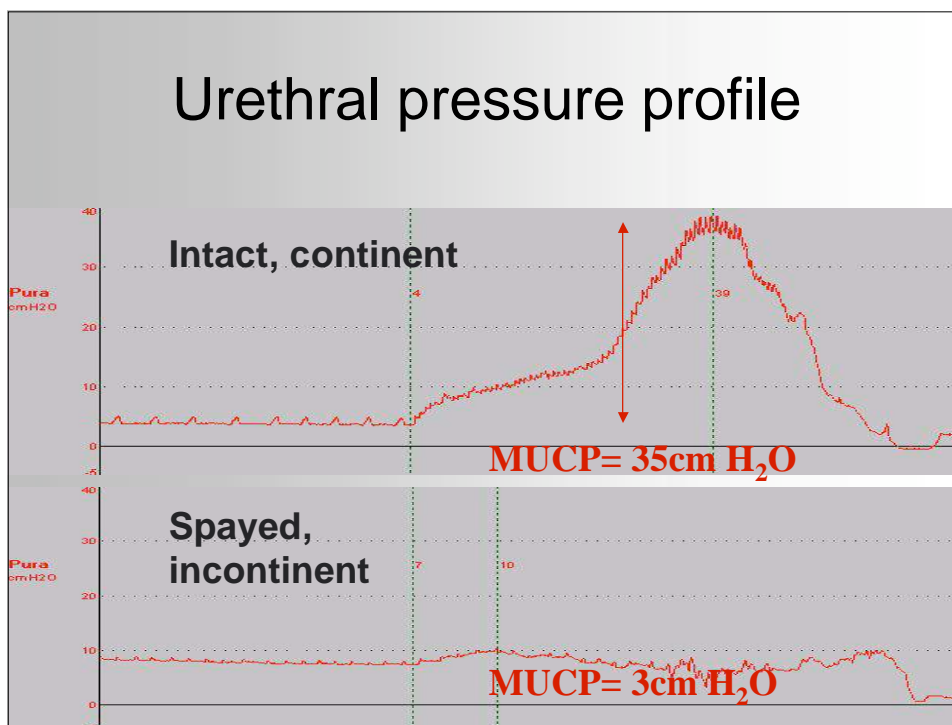
Continent	18 cm H ₂ O
Incontinent	4 cm H ₂ O
<hr/>	
Critical limit	7.5 cm H ₂ O

Arnold 1997

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Factors contributing to urethral closure

- Neuromuscular components 60%
 - Somatic 0%
 - Sympathetic 50%
 - Parasympathetic 10%
- Non-neuromuscular components 40%
 - Venous plexus 20%
 - Connective tissue 20%

Awad 1976, Bump 1988, Downie 1976, Rud 1980, Raz 1972

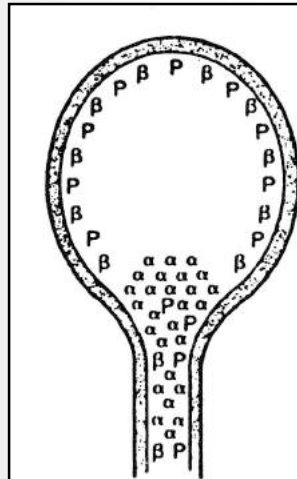
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Therapy USMI

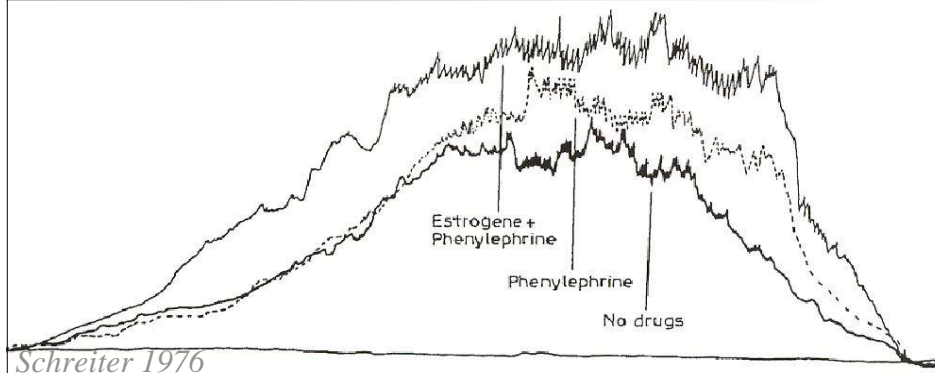
- α -adrenergic substances
 - Phenylpropanolamine
(1,5mg/kg bid, tid PO)
 - Ephedrine
(1-2mg/kg bid PO)
- Continenence: 85-98%



Arnold 1989, Blendinger 1995, Scott 2002, Burgherr 2006

Therapy USMI

- α -adrenergic substances
- Oestrogens:
 - Increased responsiveness to alpha-agonists



Schreiter 1976

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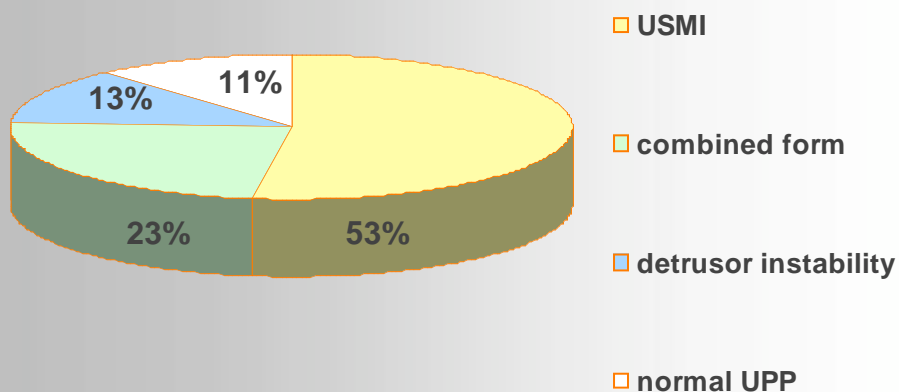
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Therapy USMI

- α -adrenergic substances
- Oestrogens:
 - Increased responsiveness to alpha-agonists
 - Cell growth and proliferation
 - Increase of bladder threshold
 - Continence: 60-65%
 - Estriol 1mg /dog /day

Hodgson 1978, Larsson 1984, Versi 1988, arnold 1997, Janszen 1997, Nickel 1998, Blakemann 2001, Mandigers 2001

Forms of UI in spayed bitches



Nickel 1997

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Combined Therapy

α -adrenergic substances

&

drugs for detrusor instability

- Anticholinergic agent (propantheline)
- Antispasmodic medications (oxybutynine, tolteridine, flavoxate, diphenpyraline)
- Tricyclic antidepressants (imipramine, doxepine)
- Beta agonist (terbutaline)

Combined Therapy

Phenylpropanolamine 1.5mg/kg bid-tid

&

Flavoxate 10mg/kg bid



&



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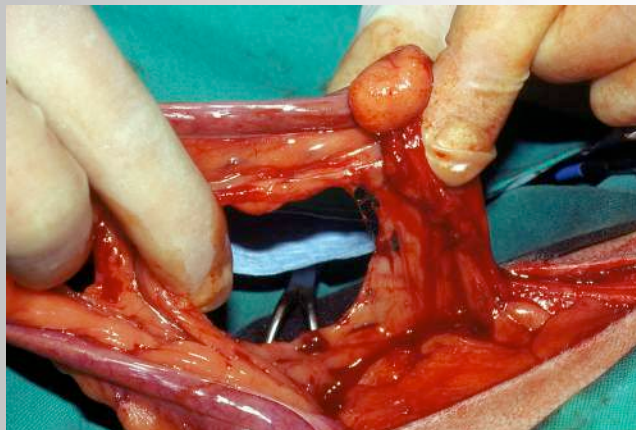
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Effect of treatment

- Urethral closure ↑
- Relaxation of the bladder
- Compensation of the “oestrogen deficit”

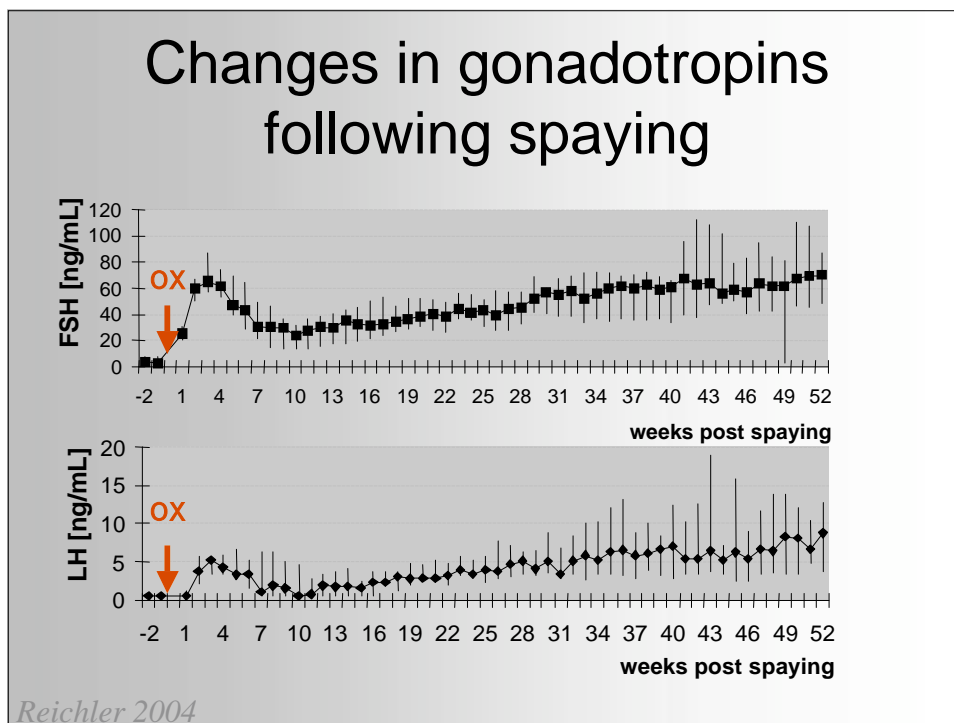
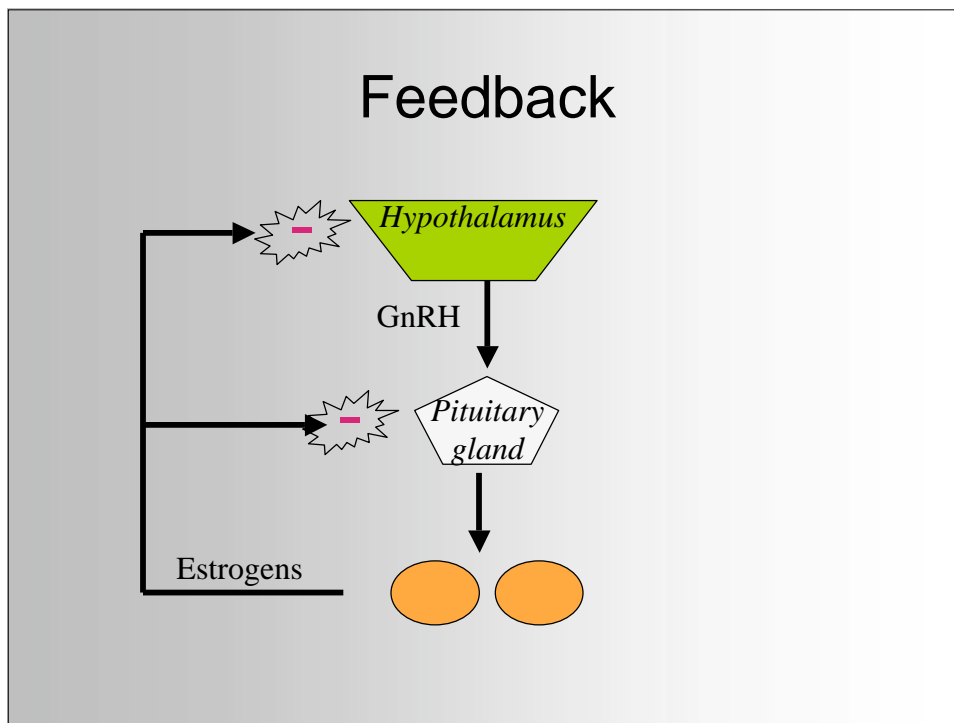
Removal of the ovaries →
endocrine consequences?



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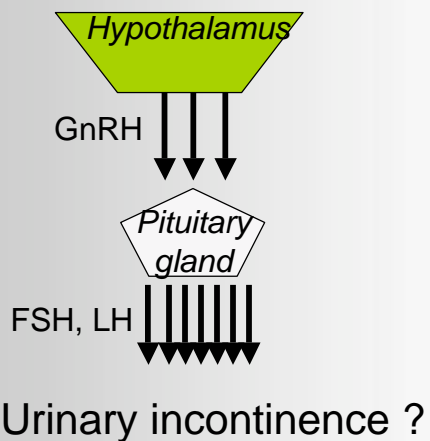


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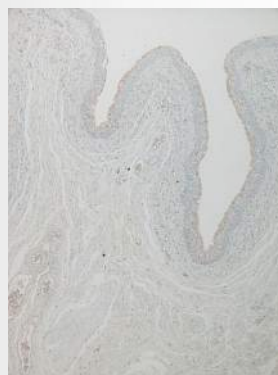
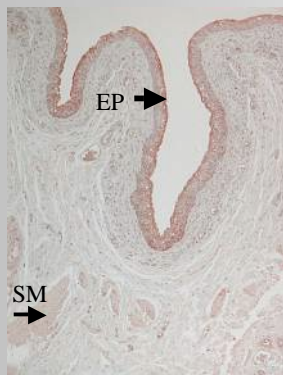
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Disturbed Feedback



FSH-, LH- and GnRH-receptors in the urinary tract



Welle 2006

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GnRH treatment

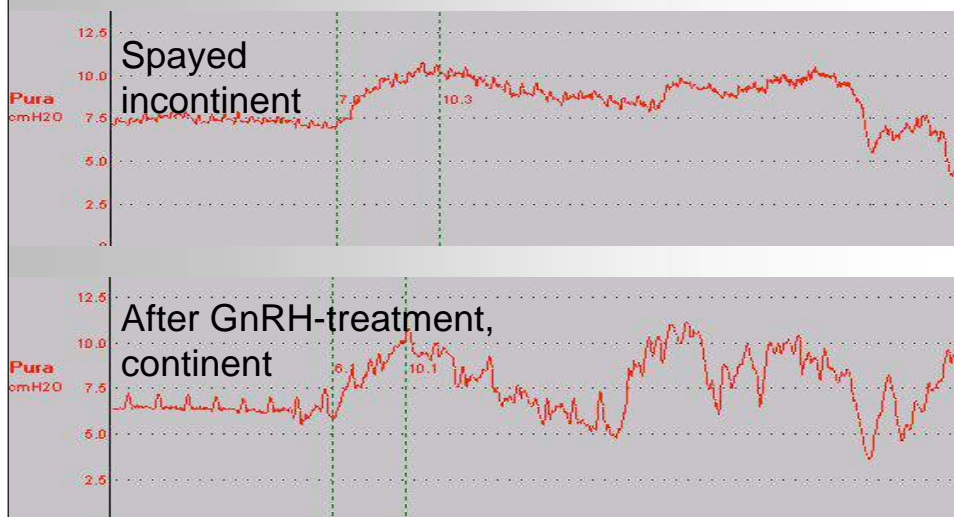
35 incontinent bitches

- 18 continent
- 13 improved
- 4 unchanged



Reichler 2006

UPP after GnRH treatment:

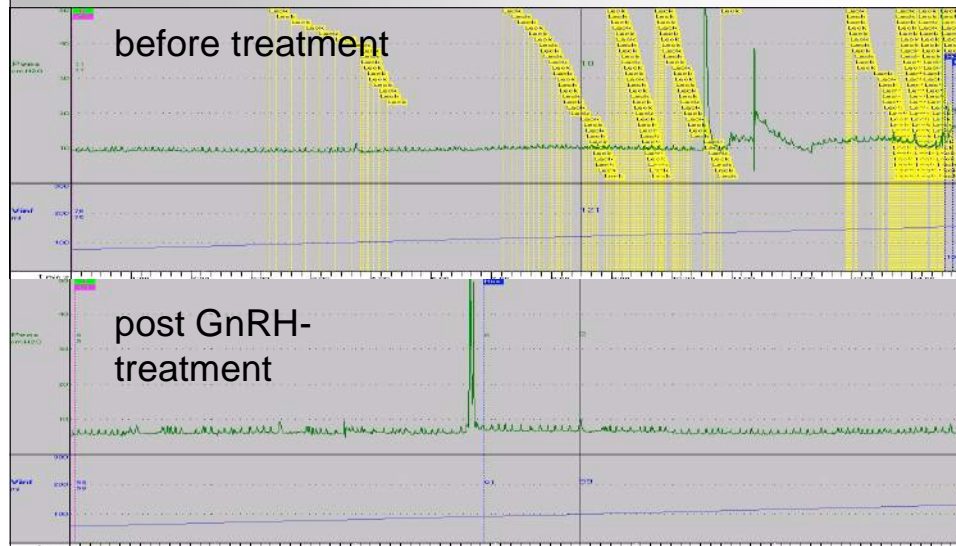


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Cystometry



Endoscopic injection of collagen

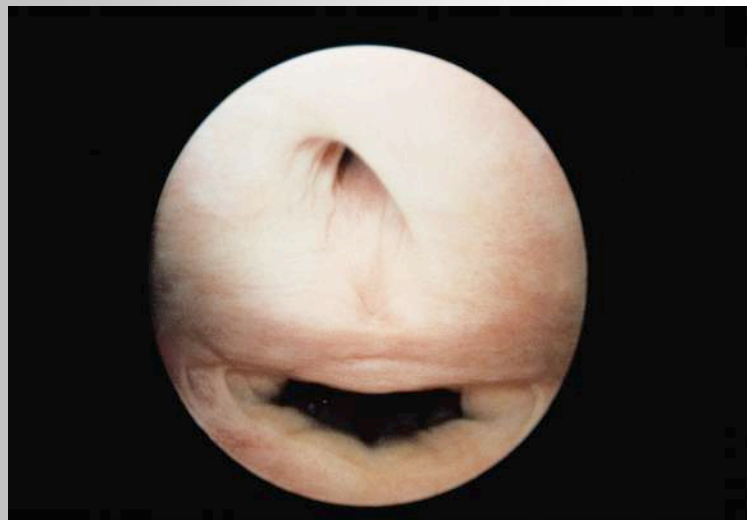


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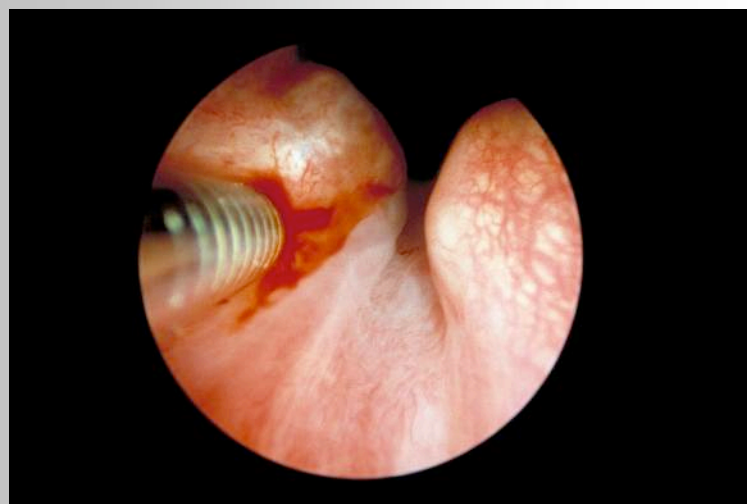
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Urethra
Vagina



Submucosal injection of
collagen

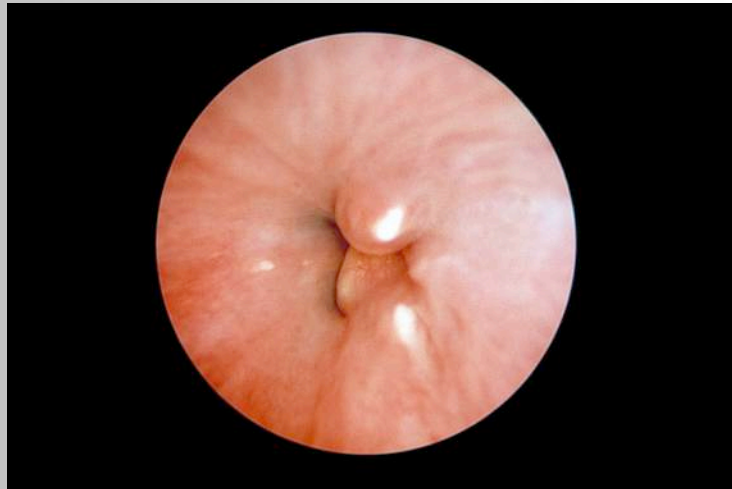


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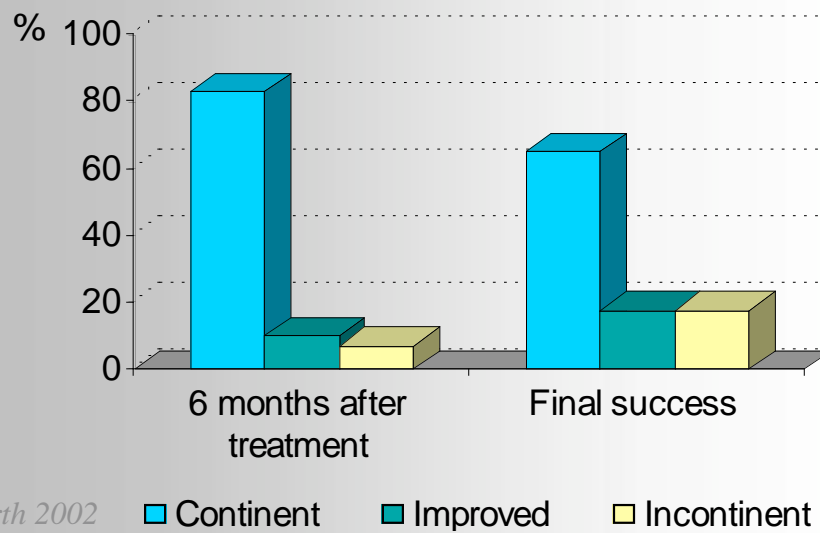
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End of procedure



Long-term success of collagen injection



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ESVD Grant

