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## Introduction

Urinary incontinence (UI) occurs when the voluntary control of the bladder and urethral sphincters disappears, resulting in a constant or frequent involuntary loss of urine during storage. In adult bitches, the main cause (in 85% of the cases) is the urethral sphincter mechanism incompetence (USMI), acquired especially post neutering, and ectopic ureter (UE). Others less frequent would be detrusor instability, neurogenic incompetence, intersexuality, bladder neoplasia, ureterovaginal fistula, vaginal neoplasia and vesiculo-vaginal fistula.

There is a lot of controversy about the pathophysiology but sure is that there are multiple factors that can predispose to acquired UI in adult bitches, such as adult weight, age of neutering, and the breeds (medium to large) among others. The first episodes of acquired UI may appear between 2 and 5 years post-sterilize

## Treatment

### Medical

1. Phenylpropanolamine hydrochloride
2. Diethylstilbestrol

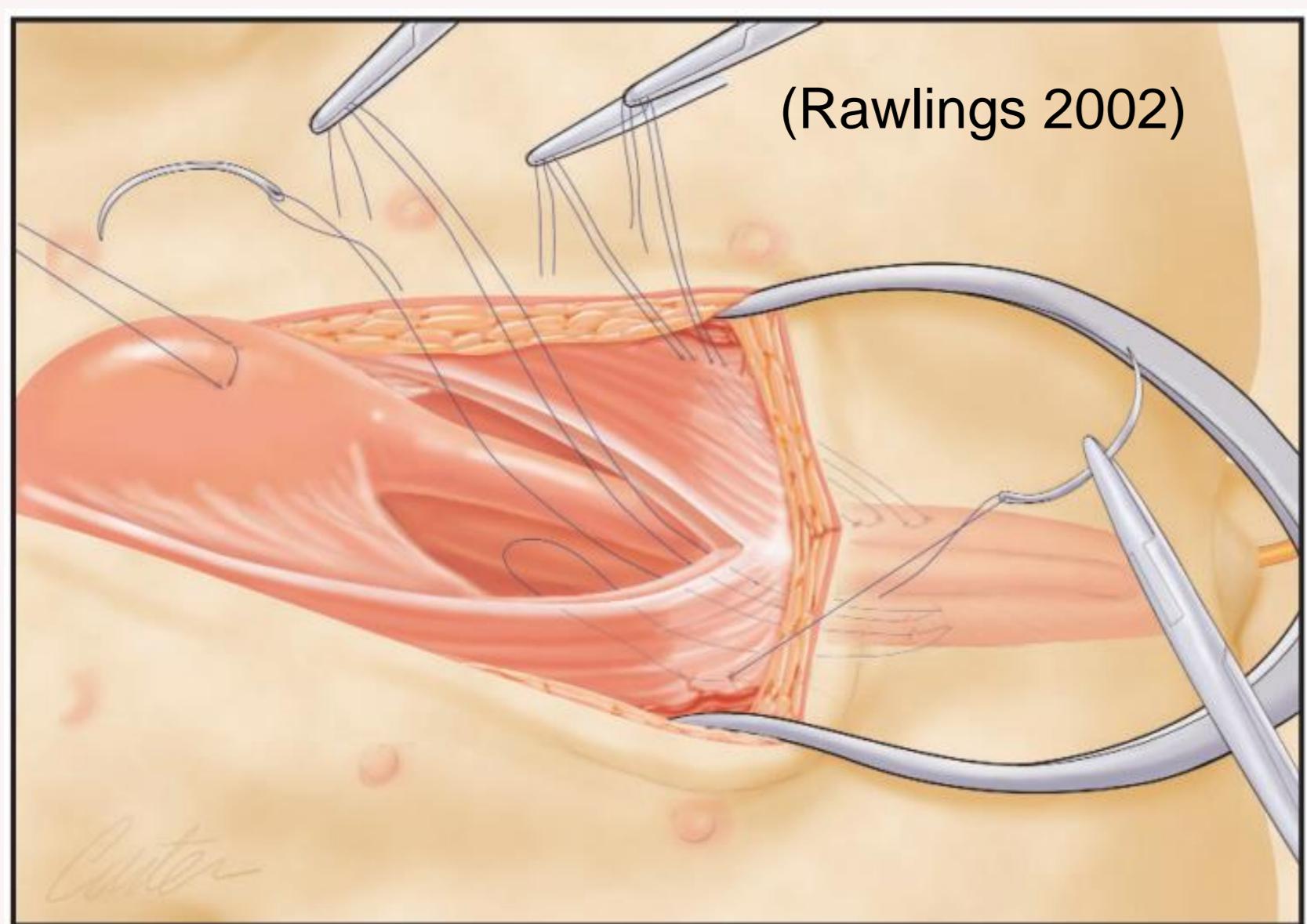
### Surgical techniques

1. Realization of pexias
2. Injection of substances
3. Placement of devices

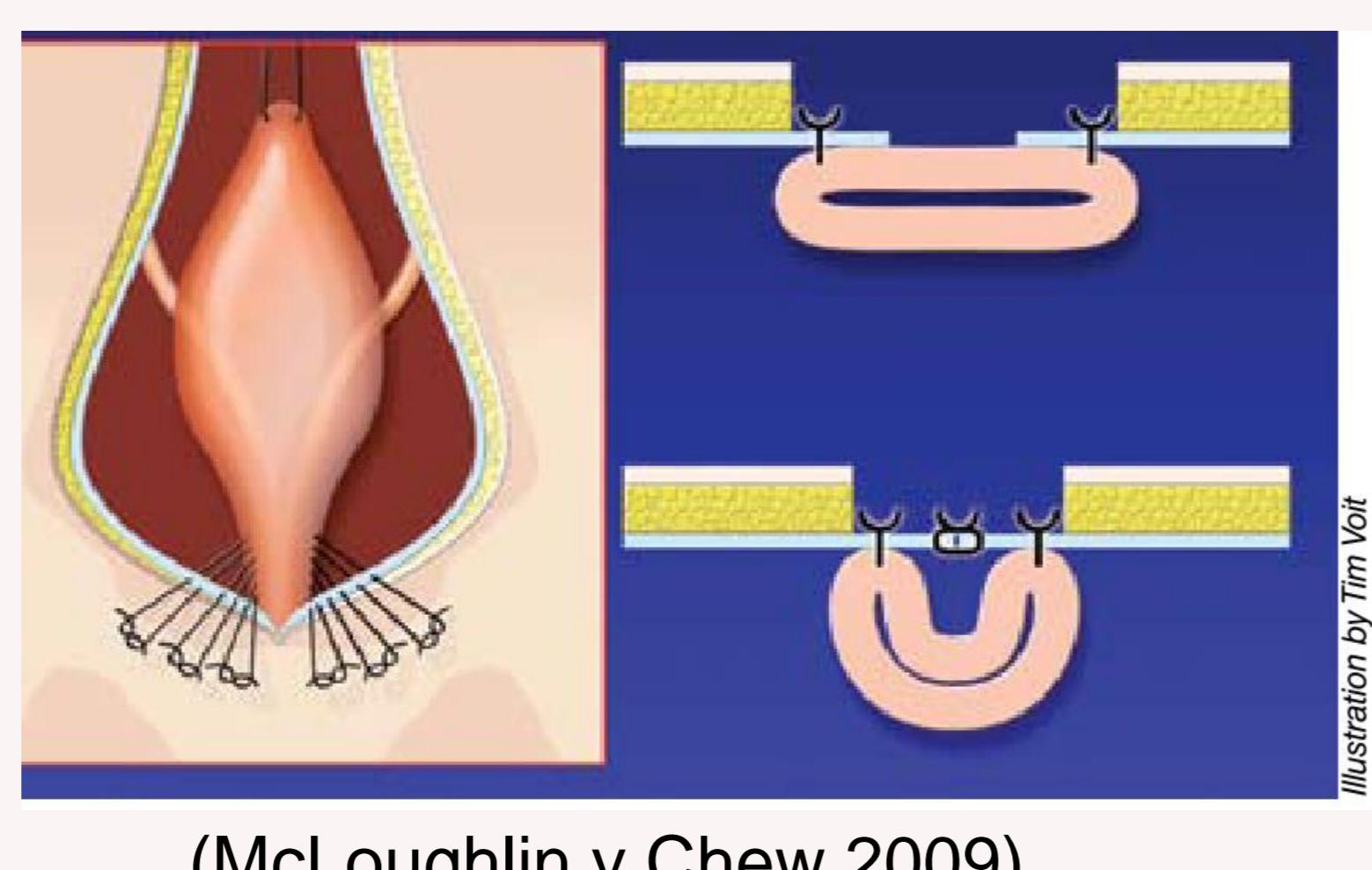
## Objectives

- Define the surgical options for the treatment of acquired UI in adult bitches.
- Compare the success rate of each surgical techniques.
- Determine the advantages and disadvantages of each surgical techniques.

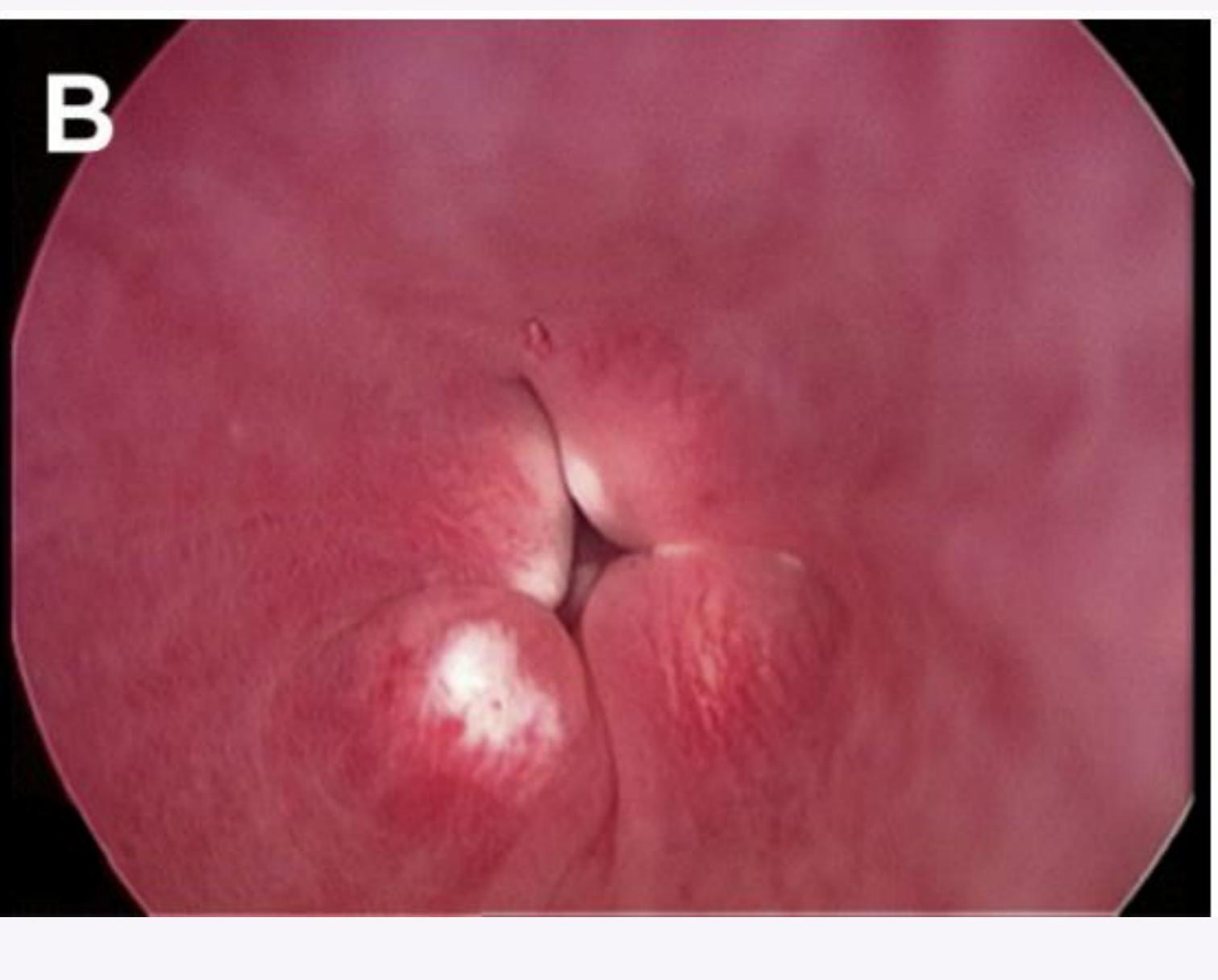
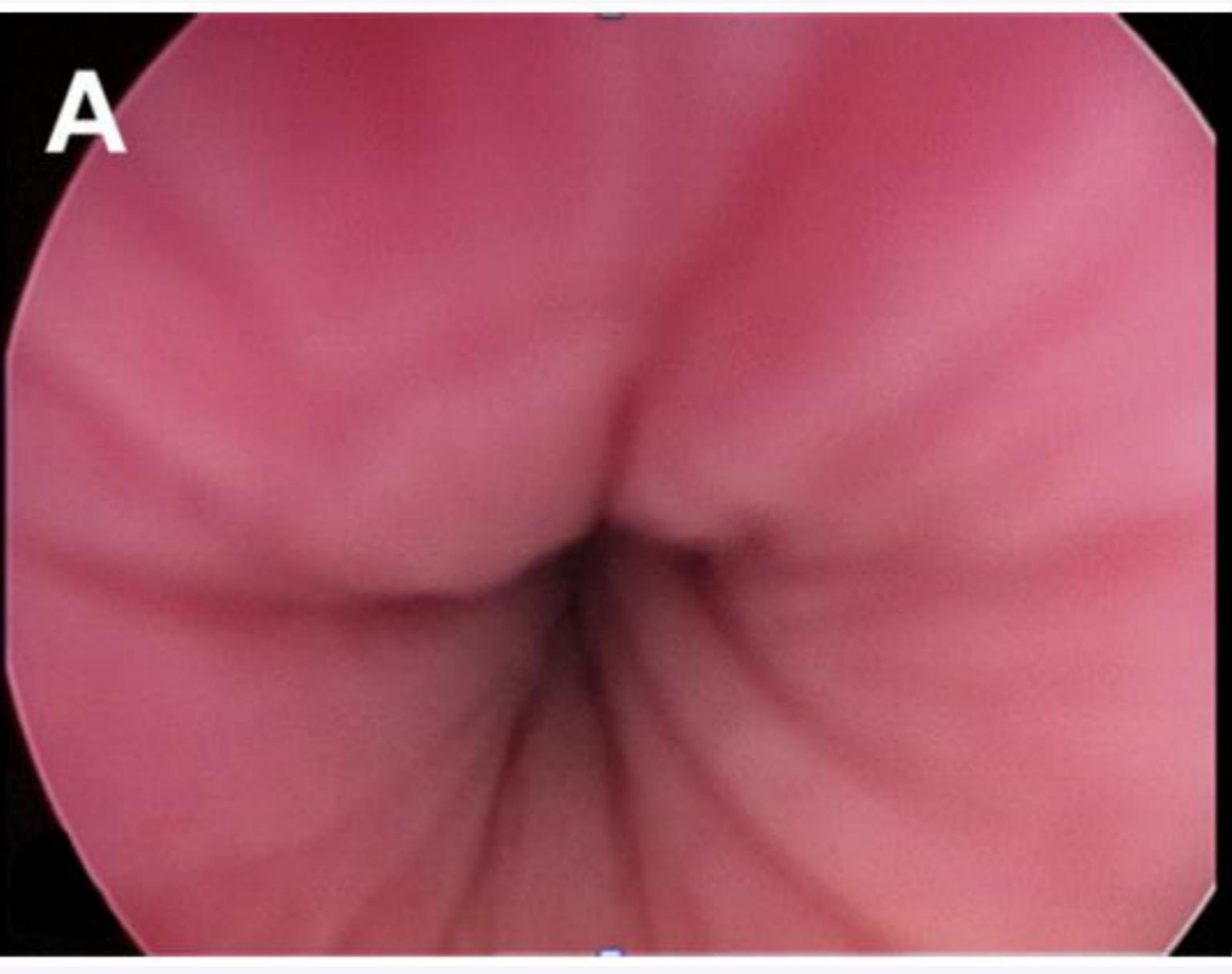
### Colposuspension



### Urethropexy

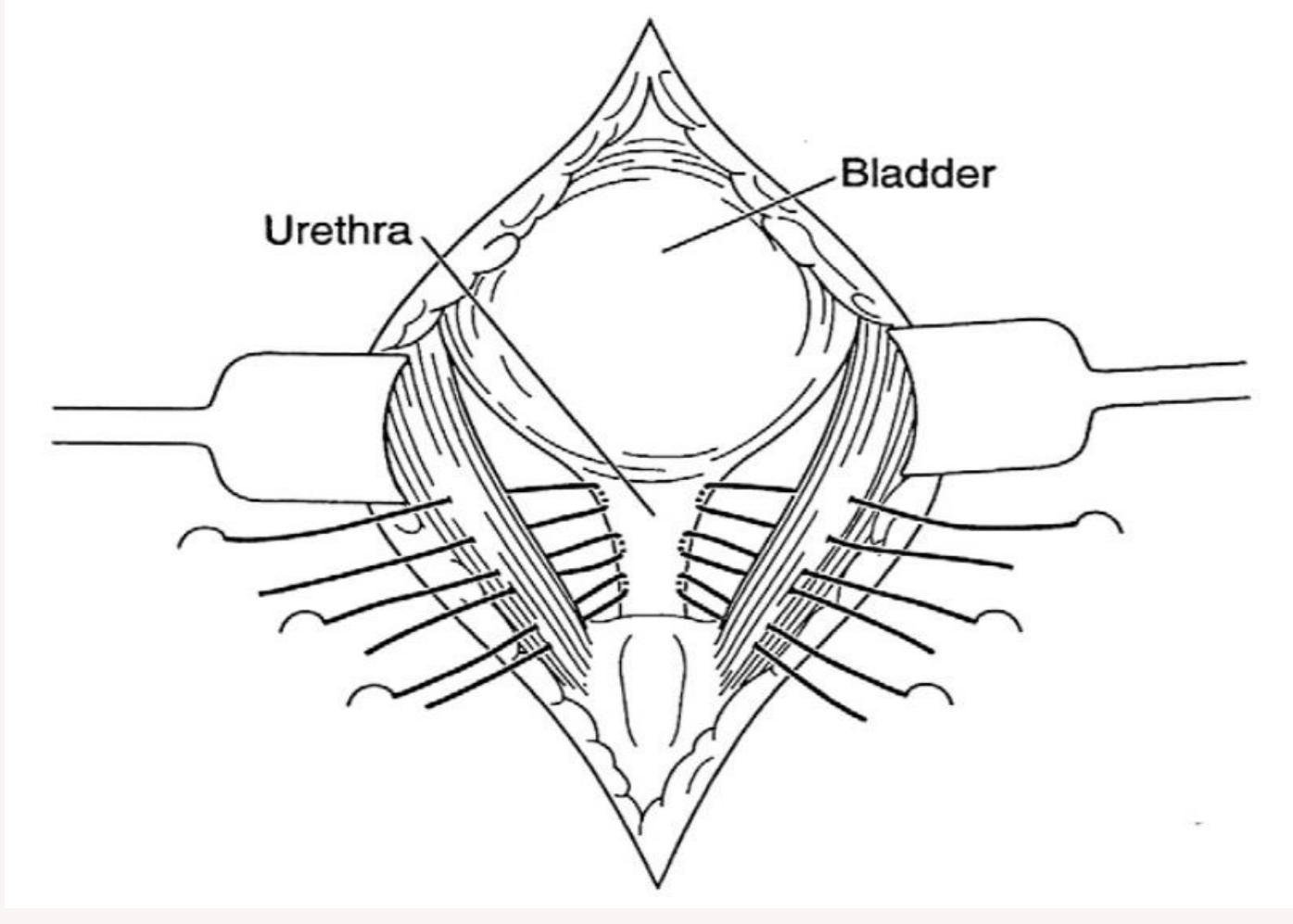


### USMI before injection

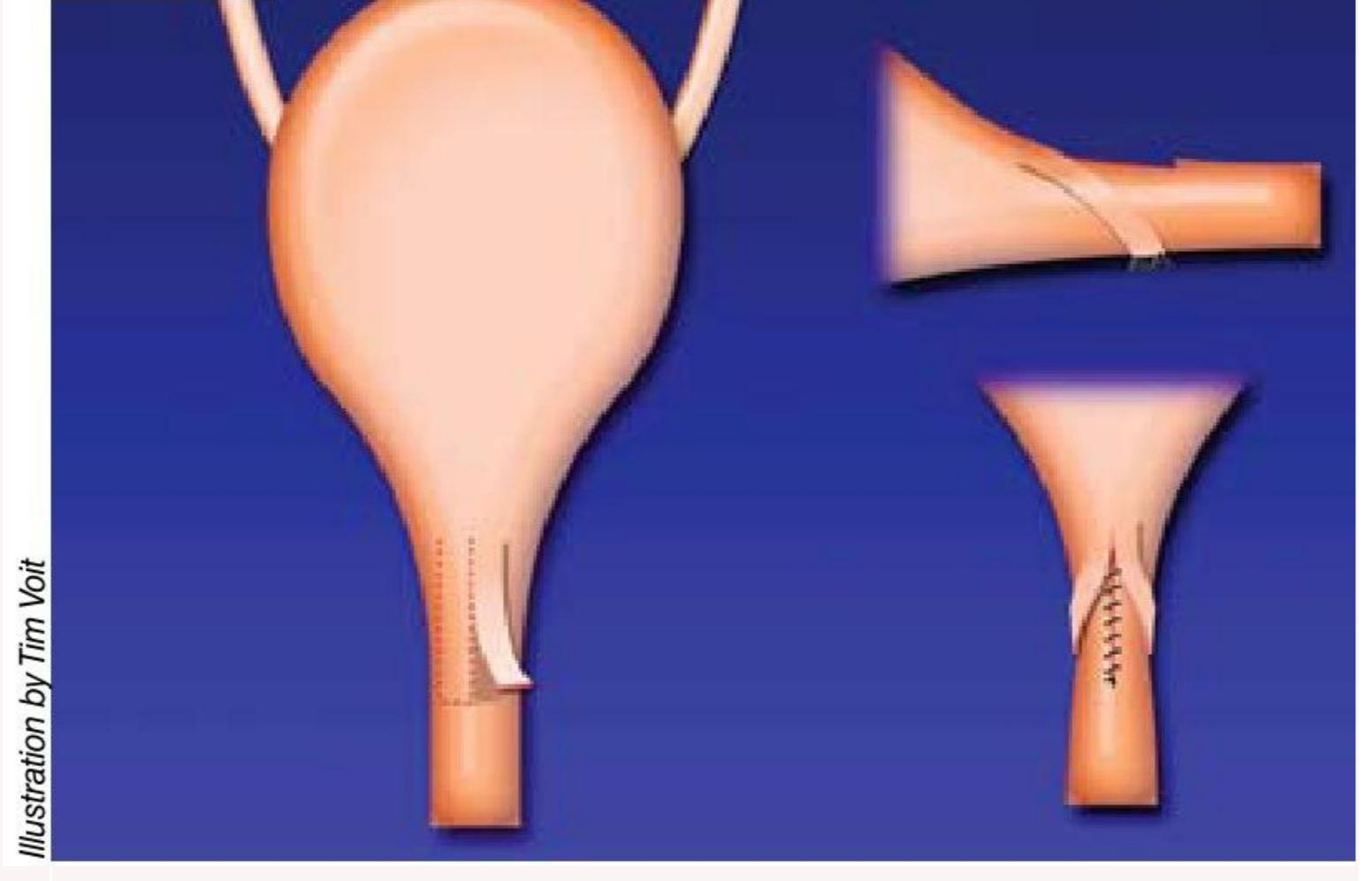


### After injection

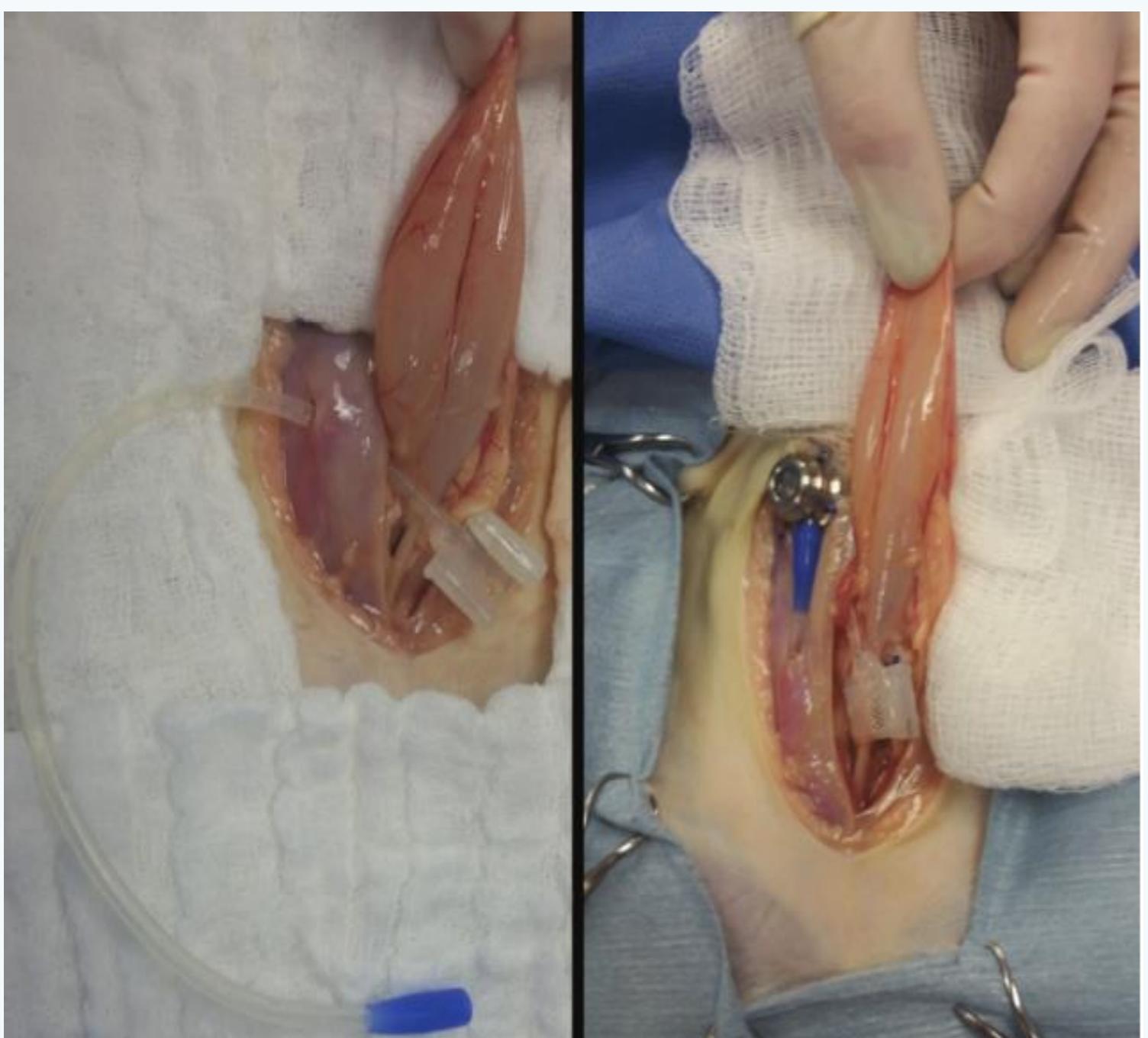
### Cystourethropexy



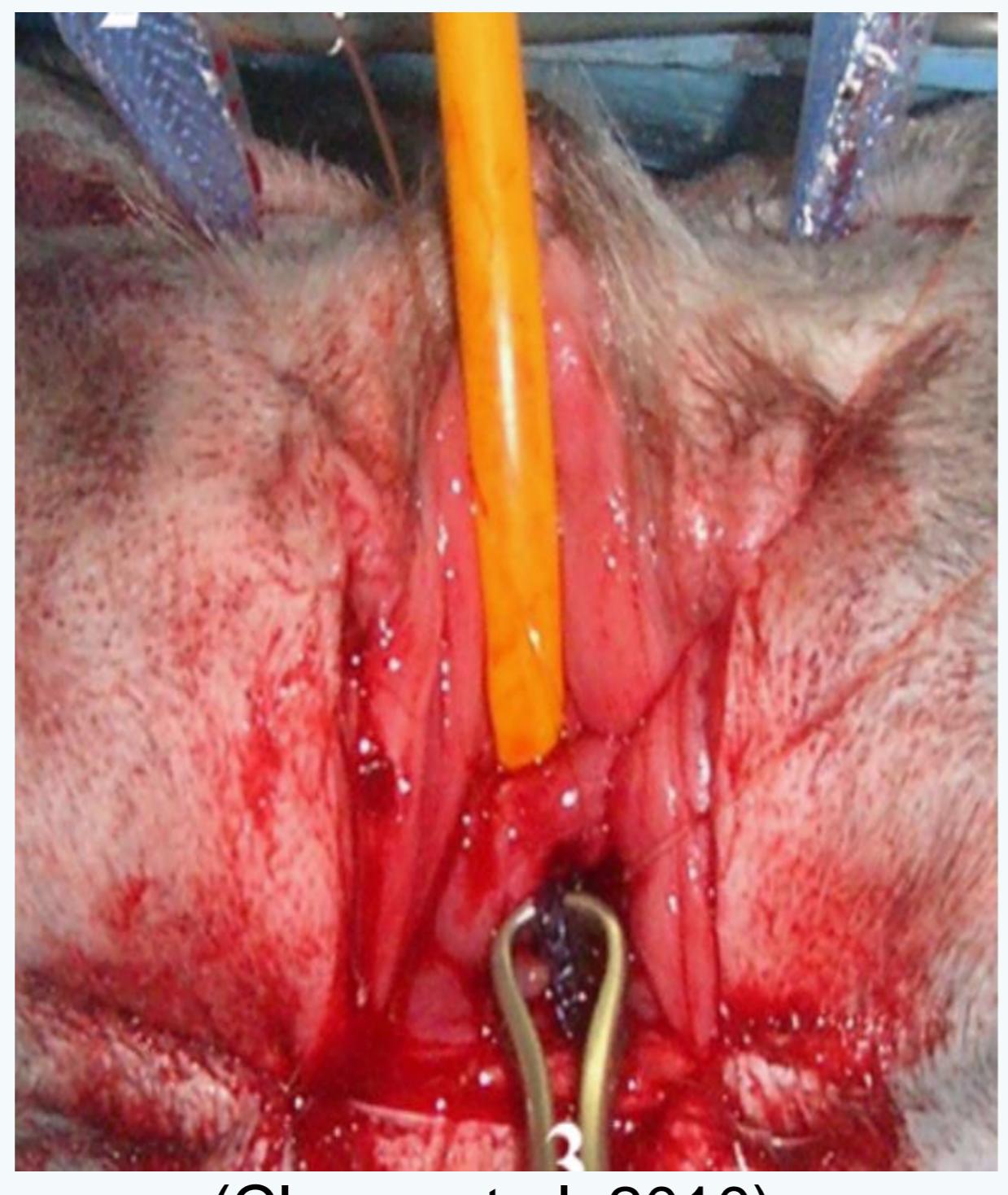
### Urethroplasty



### Artificial urethral sphincter



### Vaginal transobturator tape



Surgical technique	Paper		Data		Average follow-up period (months)
	Author	Year	nº of cases	Postoperative success rate (%)	
Colposuspension	Holt et al.	1990	150	53 (excellent) 37 (improved)	33,6
	Marchevsky et al.	1999	60	40 (excellent) 42 (improved with medicine)	
	Rawlings et al.	2001	23	55 (excellent)	
Urethropexy	R. White	2001	100	56 (excellent) 27 (improved)	35,4 40,1
				20 (excellent) 40 (improved)	
				100%	
Cystourethropexy	Massat et al.	1993	10	70%	1,5
				40% (excellent) 60% (recurred)	
				77% (excellent)	
Urethroplasty	Bushby and Hankes	1980	1	53% (excellent with surgery only)	22
	Martinoli et al.	2014	30	68% (injection) 18% (injection+ medicine)	
				100%	
Colposuspension & urethroplasty	Muir et al.	1994	5	40% (excellent) 60% (recurred)	17
				56% (excellent) 67% (improved)	
				92,50% (excellent)	
Teflon	Arnold et al.	1989	22	12,5	*tested to see how the device worked.
				25% (7 with Colpo.) 25% (6 without Colpo.)	
				15,4% (4 with medicine)	
Glutaraldehyde cross-linked collagen	Arnold et al.	1996	32	87,50%	41
				92%	
				11,3	
Collagen	Barth et al.	2005	40	16,4	19
				100%	
				26 - 30	
Bovine cross-linked collagen	Byron et al.	2011	31	36,4%	13,73
				56% (excellent) 67% (improved)	
				92,50% (excellent)	
Artificial urethral sphincter	Adin et al.	2004	6 (cadaver)	100%*	32
	Rose et al.	2009	4	100%	
	P. Delisser et al.	2012	11	36,4%	
Vaginal transobturator tape	Currao et al.	2013	18	56% (excellent) 67% (improved)	22
	Reeves et al.	2013	27 (18 USMI)	92,50% (excellent)	
	Nickel et al.	1998	26	25% (7 with Colpo.) 25% (6 without Colpo.)	
	Claeys et al.	2010	7	15,4% (4 with medicine)	11,3
	Deschamps and Roux	2015	12	87,50%	
				92%	

## Conclusions

1. Among the existing surgical techniques for the treatment of acquired UI in adult bitches, colposuspension has been the most used in history. However, performed as the only technique, its success rate only slightly exceeds 50%.
2. Although there are few comparative studies at present, urethropexy combined with colposuspension may be considered a good surgical protocol, since it has been shown to increase the success rate up to 70%.
3. Regarding the most innovative techniques, both periurethral collagen injection and AUS placement, provide success rates similar to the combination of colposuspension and urethropexy, but are less invasive and offer better postoperative techniques. The main problem is the economic cost.
4. TVT can be considered a good alternative to previous techniques, since in addition to demonstrating equal or higher success rates, it is an economical and faster surgical technique to do.
5. The main drawback of all surgical techniques for the treatment of acquired UI is its poor long-term efficacy.