

CIRUGÍA ESPAÑOLA

www.elsevier.es/cirugia



Original article

Ventral rectal sacropexy (colpo-perineal) in the treatment of rectal and rectogenital prolapse

José M. Enríquez-Navascués,^{a,*} José L. Elósegui,^a Francisco J. Apeztegui,^b Carlos Placer,^a Nerea Borda,^a Martín Irazusta,^a José A. Múgica,^a and Javier Murgoitio^a

^aServicio de Cirugía General y Digestiva, Sección de Cirugía Colorrectal, Unidad de Suelo Pélvico, Hospital Donostia, Donostia, Spain

^bServicio de Ginecología y Obstetricia, Unidad de Suelo Pélvico, Hospital Donostia, Donostia, Spain

ARTICLE INFO

Article history:

Received January 9, 2009

Accepted February 10, 2009

Online July 23, 2009

Keywords:

Rectal prolapse

Ventral rectopexy

Genital prolapse

Colpopexy

A B S T R A C T

Introduction: Ventral sacral-rectopexy with mesh corrects rectal prolapse and minimises rectal dissection. Subsequent colporectopexy corrects apical and posterior prolapses of the vagina. The combination of both procedures can lead to the simultaneous correction of pelvic organ prolapses (POP).

Objective: To present the results of a patient series with several types of POP treated using the same approach and operation.

Material and method: A total of 57 patients diagnosed with any type of POP were operated on between January 2005 and August 2008 using ventral rectal-colpo-sacropexy, who were grouped into 3 types: A, total rectal prolapse isolated or combined with a hysterocele or colpocele (11 patients); B, rectoenterocele with internal rectal invagination and/or descending perineum (4 patients); and C, middle and posterior genital compartment prolapse (42 patients). The laparoscopic approach was used in the 15 patients of groups A and B and 11 from group C. A biological mesh was used in 41 patients and a macroporous synthetic one in the rest.

Results: The mean age of the patients in the series was 66 (19–81) years, with 55 females and 2 males. The median follow up was 25 (4–48) months. There were no major post-surgical complications. A recurrence of prolapse was recorded in one patient in group A (1/11); the 7 patients who suffered from incontinence improved after the surgery, no case of de novo constipation being recorded and an improvement in 8 of the 9 patients from groups A and B with obstructive defecation. There were 9 (21%) recurrences detected in group C, but only 4 (9%) required reintervention. In all the recurrences a biological mesh had been used.

Conclusions: Laparoscopic ventral rectal-colpo-pexy is an effective technique to correct POP. Although safe and innocuous, the results with biological meshes did not last as long.

© 2009 AEC. Published by Elsevier España, S.L. All rights reserved.

*Corresponding author.

E-mail address: josemaria.enriqueznavascues@osakidetza.net (J.M. Enríquez-Navascués).

0009-739X/\$ - see front matter © 2009 AEC. Published by Elsevier España, S.L. All rights reserved.

Recto (colpo, perineo) sacropexia ventral en el tratamiento del prolapso rectal y rectogenital

R E S U M E N

Palabras clave:

Prolapso rectal;
Rectopexia ventral;
Prolapso genital;
Colpopexia

Introducción: La sacrorrectopexia ventral con malla permite la corrección del prolapso rectal minimizando la disección del recto. La colpoxia posterior corrige los prolapsos apicales y posteriores de la vagina. La combinación de ambos procedimientos permite la corrección simultánea de los prolapsos de los órganos pelvianos (POP).

Objetivo: Presentar los resultados de una serie de pacientes con distintos tipos de POP tratados mediante la misma técnica quirúrgica.

Material y método: Entre enero de 2005 y agosto de 2008 intervinimos mediante una recto(colpo)sacropexia ventral a 57 pacientes diagnosticados de alguna forma de POP, que dividimos en tres grupos: grupo A, prolapso rectal total aislado o combinado con histerocele o colpocele (11 pacientes); grupo B, rectoenterocele con invaginación rectal interna y/o periné descendente (4 pacientes), y grupo C, prolapso genital del compartimento medio-posterior (42 pacientes). Se intervino por vía laparoscópica a los 15 pacientes de los grupos A y B y a 11 del grupo C. En 41 casos se empleó una malla biológica, y en los demás, una sintética macroporosa.

Resultados: La media de edad de la serie era 66 (19–81) años; 55 eran mujeres y 2, varones; la mediana de seguimiento fue 25 (4–48) meses). No hubo complicaciones postoperatorias mayores. En el grupo A registramos una recurrencia del prolapso (1/11); los 7 pacientes que presentaban incontinencia mejoraron tras la intervención; no se registró ningún caso de estreñimiento de novo y 8 de los 9 pacientes de los grupos A y B, con defecación obstructiva, mejoraron. En el grupo C se detectaron 9 (21%) recurrencias de alguno de los compartimentos vaginales, pero sólo 4 (9%) requirieron reintervención. En todas las recurrencias se había utilizado una malla biológica.

Conclusiones: La recto(colpo)pexia ventral laparoscópica es una técnica efectiva para corregir los POP. Con las mallas biológicas, aunque seguras e inocuas, obtuvimos resultados menos duraderos.

© 2009 AEC. Publicado por Elsevier España, S.L. Todos los derechos reservados.

Introduction

Disorders of the stability and support of the pelvic floor and organs are mostly due to imbalances resulting from forces of expulsion and retention. The main expulsion force is the increase of intra-abdominal pressure, the resulting force vector of which occurs in the central perineal raphe, whilst the retention forces are represented by the musculoaponeurotic anchorage systems of the pelvic floor organs which oppose increases in abdominal pressure. Therefore, as well as age, mechanisms which favour the development of pelvic organ prolapse (POP) are related with the conditions that increase intra-abdominal pressure, such as vaginal births and hormonal or surgical modifications to the support components. However, the pathogeny of some rectal prolapse may not fall under this description, which highlights their disconcerting epidemiology, but nonetheless the most effective method for anatomical repair is surgical attachment to the pelvis,¹ as with other types of POP.²

POPs can develop in a combined manner (genito-urinal more frequently than genito-rectal), simultaneously or successively, and there are many epidemiological studies

that list and number these associations, which occur both from an anatomical point of view (eg, rectal invagination and rectoenterocele) and functionally (mixed incontinence, dysfunctions).^{3,4} As such, patients present a combination of symptoms which occur depending on the hiatus or the affected pelvic vault, produced as a direct effect of the POP, such as exteriorisation, weight, pelviperineal bulging and due to genital, urinal or intestinal dysfunction.

There are various surgical options for the treatment of POP, using perineal and abdominal approaches, for each individual cavity, with their relative advantages and disadvantages.

Front face/ventral rectal Sacropexy (colpo-perineal) using a mesh, whereby the rear face and/or the vaginal cupula or perineum is incorporated into the mesh, depending on the pathological combinations, aims not only to reattach the rectum or vagina in the case of prolapse of these organs, but also to reconstruct the recto-vaginal septum and levels 1 and 2 of the pelvic support as described by DeLancey,⁵ which allows for the simultaneous repair of the different POP that appear, isolated or combined, via the uro-genital diaphragm, the ano-rectal hiatus or muscular support (descending perineum).

We present an observational study of the anatomical results obtained in a series of patients diagnosed with rectal or recto-genital prolapse—isolated or combined—with surgical intervention using ventral sacrocolpopexy and/or rectopexy with biological mesh, carried out during colorectal surgery or together with gynaecological surgery.

Patients and methods

A total of 57 patients diagnosed with any type of POP were operated on between January 2005 and August 2008 and were grouped into 3 types: group A, total isolated external rectal prolapse (9 patients) or combined with a hysterocele or colpocele (2 patients); group B, rectoenterocele with internal rectal invagination (4 patients, 2 of these with concomitant descending perineum syndrome [DPS]); and group C, middle and posterior genital cavity prolapse (42 patients); this was a difficult group to categorise due to the concomitance of uro-genital alterations which required associated surgical interventions.

The laparoscopic approach was used on all the patients from groups A and B; rectopexy was carried out with a biological mesh which incorporated the perineum or vagina in the case of concomitant occurrences, and hysterোসacrocolpopexy was carried out on group C using the Pfannenstiel laparotomy approach in 31 patients and laparoscopy in the remaining 11, in accordance with the surgeon's or gynaecologist's experience.

An acellular porcine dermis biological mesh (Pelvicol®, Bard) was used in 41 patients, a polypropylene macroporous synthetic mesh (Ginemesh®, Ethicon) was used in 10 patients and a combination of both was used in the remaining 6 patients; the reason for the choice of one type of mesh or another is explained below.

We use a uniform clinical report (Annex 1) which lists the occurrences of POP, any previous uro-genital or ano-rectal surgeries and the structural functional symptoms (pelviperineal, intestinal, genital, or urological). Patients with genito-urinary prolapse were rated in accordance with the POP-Q quantification system from the International Continence Society.⁶ Image and/or functional studies were carried out via endoscopy, defecography, transit-time urodynamics, anorectal manometry, or endoanal ecography, depending on patient history and exploratory findings. Those patients with a history of total external prolapse which was not evident at the time of the physical examination or defecography were asked to take a photograph themselves of the rectal prolapse when it was exteriorised.

Surgical technique: colorectal surgeons use laparoscopy of the pelvic floor or rectum. Gynaecologists approach the pelvis from the left with an optical trocar but with the working trocars in an inverted position. It is helpful to be positioned between the legs of the patient so as to better manipulate the rectum or vagina with the aim of easing identification and visualisation.

The sacral promontory is minimally exposed, taking care not to injure the hypogastric right nerve; the peritoneal incision extends in the shape of an inverted J towards the

Figure 1 – Sacrocolpopexy with mesh and inverted Y.

Figure 2 – Ventral sacrorrectopexy with mesh that can be attached to the vagina (colpopexy) and also to the perineum (perineopexy).

bottom of the Douglas pouch, and the rectovaginal septum is dissected. The depth of this dissection will depend on the structures to be incorporated into the repair; the vagina requires a 4cm dissection in the front and rear sides to attach a mesh to them in the shape of an inverted Y (Figure 1); for rectal prolapse the whole front side of the inferior rectum is dissected, but not the posterior or posterolateral sides, up to the anorectal union (large rectoenteroceles may require an external perineal incision). A trapezoidal mesh is prepared, 12-15 cm long and 5.5 cm wide in the distal half and 3.5 cm

long in the proximal half which is put in place using 4-6 non-absorbable stitches (Ticron® 2-0, Tyco Healthcare) in the muscular layer of the anterolateral faces of the inferior rectum and the uterosacral ligaments are incorporated in the case of an enterocele or hyteroceles; or, in the case of rectocele or descending vaginal cupula, the stitches are put into the anterior and posterior sides of the vaginal cupula (Figure 2). Using 2 stitches of the same material the mesh is fixed in place to the anterior ligament of the sacral promontory. The lateral border or the incisioned peritoneum is closed above the mesh thereby raising the bottom of the Douglas pouch.

Results

The patient group consisted of 55 females and 2 males with a mean age of 66 (19–81). The median follow-up period was 25 months (4–48 months).

Of group A (total rectal prolapse), one patient had a previous operation (Delorme). A biological mesh was used in 4 patients, in 3 patients a biological mesh reinforced with another polypropylene mesh was used, and in 4 other patients a polypropylene mesh was used on its own. There were no major post-surgical complications. However, a prolapse recurrence was recorded in one patient 6 months after surgery; a laparoscopy was carried out and it was found that the mesh had become unattached from the promontory, but the rectum and the vaginal wall were still well integrated into the mesh. The promontory was reattached using sutures with positive results to date. The average hospital stay of the group was 2 days (1–3 days).

For one of the patients from group B, the abdominal laparoscopy was completed with a perineal incision to anchor the mesh in the perineal raphe, thus the rectovaginal septum was reconstructed along its whole length. There was no postoperative morbidity, though one patient with DPS who had had a biological mesh fitted had a total rectal prolapse 1 year after intervention which was treated with laparoscopic ventral rectopexy with a propylene mesh, combined with

sigmoidectomy, with good anatomical and functional results 2 years after surgery.

Thirty one of the patients from group C had previously had a hysterectomy (mainly vaginal). Together with sacrocolpopexy, 10 suburethral tapes were put in place (4 TVT, Ginecare®, Ethicon; 6 TOT Monarc®, AMS), for urinary incontinence due to force, and another 5 patients had concomitant central or lateral cystocele correction. During follow-up, 9 (21%) anatomical recurrences of POP over stage II were seen. However, during follow-up the weak lineal correlation between the anatomy and the symptoms was affirmed. Three of the recurrences occurred in the middle cavity and 6 in the front or rear cavity. Four patients (9%) had further surgery due to recurrence, 3 of them underwent sacrocolpopexy with a polypropylene mesh (all 4 patients had had a biological mesh) and in the other, the vaginal cupula was fixed to the sciatic spine (Richter operation). The morbidity of this group was produced due to surgery (vaginal erosion by vaginally placed mesh). The average hospital stay of the group was 5 days (3–8).

Table shows data relating to the initial procedures, simultaneous surgery, type of mesh used, recurrences, and prolapse reintervention.

With regards the functional, intestinal (incontinence or constipation) or genitourinal results, we only have partial data. The 7 patients from group A who suffered from some degree of preoperative incontinence improved after the surgery and there were no cases of deterioration of anal incontinence following the ventral rectopexy; there were no recorded cases of de novo constipation and 8 of the 9 patients from groups A and B with obstructive defecation experienced postoperative improvement. Constipation defined as infrequent defecation remained unaltered in 2 of the 3 patients who suffered preoperatively. None of the 2 male patients suffered retrograde ejaculation or deterioration in erectile function; however, we do not have complete preoperative or postoperative data with regards dyspareunia in the sexually active patients, although this was not an area of complaint for 5 of the patients of groups A and B for whom we have data.

Table – Groups, initial procedures, recurrences, and interventions per prolapse

	Prior interventions	Simultaneous surgery	Type of mesh	Recurrences	Reoperations
Group A (rectal prolapse) (n=11)	1 Delorme, 2 HT	–	4 biological, 3 mixed, 4 synthetic	1 (9%)	1 (9%)
Group B (rectoenteroceles+li with or without DPS) (n=4)	2 HT	1 perineorrhaphy	1 biological, 3 mixed	–	1 ^a
Group C (genitourinary POP) (n=42)	31 HT, 3 perineorrhaphies, 1 Burch	4 TVT, 6 TOT, 5 perineorrhaphies	36 biological, 6 synthetic	9 (21%) ^b	4 (9%)

DPS indicates descending perineum syndrome; HT, total hysterectomy; li, internal rectal invagination; POP, pelvic organ prolapse; TOT, transobturator tape; TVT, tension-free vaginal tape.

^aReintervention for prolapse non-related to prior intervention (see the Results section).

^bRecurrences of original prolapse or other compartment.

Discussion

The choice of approach and surgical technique for total prolapse is based fundamentally on: a) patient characteristics; b) size of the prolapse; c) concomitant pelvic disorders; and d) accompanying functional symptoms and intestinal habits. The aim of the surgery is to correct the anatomical defect, alleviate any accompanying intestinal dysfunction as much as possible and to avoid any subsequent functional consequences.

An abdominal approach rectopexy seems to be preferable to a perineal approach with regards the anatomical control of the prolapse and perhaps also the functional control.¹ All the abdominal techniques have been carried out via laparoscopy, with its inherent advantages.^{7,8}

The various techniques in abdominal rectopexy differ in the 3 following ways: a) extension of the dissection or liberation of the rectum, in which anterior dissection and in particular, posterior dissection to the pelvic floor are considered as "obligatory," and currently undergoing discussion are the potential benefits of preserving the lateral side ("lateral ligaments") with the aim of preserving the rectal innervations and avoiding postoperative "sensory" constipation; b) the method of posterior fixing of the rectum to the sacral with stitches (Effron) or with a mesh, and whether this completely (Ripstein) or partially (Wells, Orr-Loygue) surrounds the rectum, as well as the type of mesh (absorbable, Gore-Tex, Ivalon, Marlex, etc); and c) the potential association of intestinal resection (Fryckman-Goldberg) for improving both the anatomical and functional result of the intervention.

The laparoscopic ventral rectopexy with mesh for complete rectal prolapse was described by D'Hoore et al,⁹ and in a recent review of 109 patients undergoing a two year follow-up period, 3% of recurrences were recorded.¹⁰ The main characteristic of this technique is that it avoids complete posterolateral rectal dissection, suturing the mesh with the anterior face of the rectum to avoid invagination.

The anterior rectal wall has a central role in the pathogeny of the total rectal prolapse and also of internal invagination. Unlike the Delorme or Altemeier operations which reduce rectal volume and distensibility, ventral rectopexy preserves the rectal cavity intact. Hard to treat or worsening constipation occurs in 50% of cases after carrying out total posterior mobilisation of the rectum (if an intestinal resection is not associated); there are various possible causes such as torsion of the redundant rectosigmoid, thickening and rigidity of the walls following perirectal fibrosis, or secondary extrinsic autonomic rectal denervation.¹¹ In males, exclusive dissection of the anterior rectal face leaves the Denonvillier's fascia intact, thereby theoretically reducing the risk of nervous lesion.

In a randomised clinical study that compared Wells rectopexy (with mesh) with simple rectopexy (with stitches) the results confirmed equal anatomical results, and better functional results (less constipation) and less complications with the simple suture,¹² therefore, after completely mobilising the rectum (anterior and posterior), using a mesh did not add any advantages to the simple cicatricial

adherence of the rectum to the sacral concavity. The reasons for using a mesh in ventral rectopexy are different.

A ventrally placed mesh obliterates the Douglas pouch, reinforces the rectovaginal septum and provides vertical support to the perineal body, raising it up which means it is an attractive solution for treating other pelvic floor disorders such as rectoenteroceles, internal rectal invagination, perineal descent that does not respond to conservative treatment, and anchoring the mesh to uterovaginal structures for disorders of the posterior and middle pelvic cavities. In addition to this, it provides synchronous repair of combined or complex rectogenital prolapse which are seen in some 20% of cases. In this regard, positive anatomical and functional results have been obtained with the laparoscopic ventral colpo-rectopexy for this pelvic disorder, as well as for obstructive defecation due to a structural cause.¹³⁻¹⁵

We initially used a biological mesh due to its advantages such as resistance to infections (these meshes can be placed on contaminated or infected tissue) and the impossibility of erosion or visceral lesions. The aim of such meshes is to stimulate the formation of the extracellular matrix, angiogenesis and growth factors, so as a temporal support they use acellular collagen that is more or less hardwearing and definitive. However, they can suffer degrade rapidly (collagenase) and some patients have little ability to synthesise enough extracellular matrix to substitute the temporal support provided by these meshes. Recurrences of POP that we see in our series are related with sacrofixation of the meshes or with their disappearance or degradation. Our findings are similar to those obtained by Altman et al,¹⁶ who used the same biological mesh as us in rectocele cases and found their systematic use was not recommended, although it is important to point out the absence of complications or problems of dyspareunia with their use.

Complications arising from meshes in POP (erosion, fistulisation, contraction, infection) are mainly related with: the type of mesh, placement route and patient illness. The size of the pore is the most important characteristic of the synthetic meshes.¹⁷ The microporous meshes are the least resistant to infection and they also are able to erode tissue and damage viscera; the microporous meshes are made from Marlex, Mersilene, PTFE or Teflon (these last two are also multi-filamented) so we prefer to use synthetic macroporous meshes. The use of meshes transvaginally has more incidence of erosion or infection than the use of meshes transabdominally; surgery for repair of descending vaginal cupula or cystocele is the type of surgery most exposed to complications with the use of meshes¹⁷ (and that which has the most postoperative recurrences).

Of the patients with genital prolapse, we recorded 21% of recurrences in the physical examinations; however, only 4 (9%) required intervention due to symptomatic prolapse of the middle or posterior cavities, which shows the lack of linear correlation between the physical examination, radiology and symptoms, a fact which is well documented in the existing literature.^{18,19} The combined genito-urinary POPs are difficult to categorise by the different clinical and functional combinations; the anterior cavity is the "Cinderella" of this illness and clinical or subclinical urinary

Annex

1 abizena / 1st surname
2 abizena / 2nd surname
Izena / Name
Adina / Age
Zerbitzua / Service
Ohea / Bed
HK-zk. / Nº HC

Age:

Symptoms

GENITAL

Vaginal bulging
yes ☐ no ☐
Perineal heaviness
yes ☐ no ☐
Menopause
yes ☐ no ☐
Sexual activity
yes ☐ no ☐
Cotial dyspareunia/difficulty
yes ☐ no ☐

(spontaneous ☐ with effort ☐)
degree 0 _____ 10
Date: / / Vaginal flatus: yes ☐ no ☐
Decrease in vaginal sensitivity: yes ☐ no ☐
degree 0 _____ 10

INTESTINAL

Constipation/dyschezia/tenesmus
no ☐ yes ☐
Frequency of defecation:
yes ☐ no ☐
Need to frequently empty bowels
yes ☐ no ☐
Difficulty in emptying bowels
yes ☐ no ☐
Feeling of having incompletely
emptied bowels
yes ☐ no ☐
Continual need to empty bowels
yes ☐ no ☐
Self-palpation
yes ☐ no ☐
Use of laxatives/enemas
yes ☐ no ☐
Feeling or evidence of prolapsed
yes ☐ no ☐
Anal bleeding/mucous
yes ☐ no ☐

Anorectal pain
yes ☐ no ☐
History compatible with IBS
yes ☐ no ☐
Anal incontinence
no ☐ passive ☐
with force or urgent

Valzey scale:

Valzey	Never	Rare 1/mo	Sometimes >1mo	<1x weekly	daily
Incontinence of solids	0	1	2	3	4
Incontinence of liquids	0	1	2	3	4
Incontinence of flatus	0	1	2	3	4
Affects life style	0	1	2	3	4
Needs or plugs	0	1	2	3	4
Antiprur	0	1	2	3	4
Not after >15'	0	1	2	3	4

URINAL

Urinary incontinence
yes ☐ no ☐
UI associated with doing exercise
(force)
yes ☐ no ☐
Urgent/frequent UI, sudden escape with urination urge associated with stimuli
(eg, running water, etc)
yes ☐ no ☐
Complete UI, complete and total loss without any specific trigger
yes ☐ no ☐
UI frequency
> 1/d ☐ 1/d-1/week ☐
1/week-1/month ☐ <1/month ☐
Obstructive urinary symptoms
yes ☐ no ☐
Recurrent CUI
yes ☐ no ☐

Quality of life

ACTIVITY	NOTHING	SOME	A LOT
Physical			
Work			
Social			
Sexual			
Emotional			

Background

No. of pregnancies:
Previous surgery no ☐ yes ☐
No. of vaginal births:
Gynaecological (specify):
Urological (specify):
Colorectal (specify):
Homonal treatment:
General medical background:

No. of dystocic pregnancies:
Age at first birth:

Physical examination

Normal weight ☐ overweight ☐ obese ☐
VAGINAL EXPLORATION (decubitus)
Vaginal epithelial ulceration
yes ☐ no ☐
Urine-loss upon correcting prolapse
yes ☐ no ☐

ICS Classification

Stage 0:	no prolapse
Stage I:	distal border >1 cm over the hymen
Stage II:	distal border at the level of the hymen (> or <1 cm)
Stage III:	distal border >1 cm from the hymen
Stage IV:	complete vaginal eversion

Aa	Ba	C (cervix or border)
Ap	Bp	D (fornix, uterosacral ligament)

(Hymen as a point of reference)
A: anterior; B: posterior; C: cervix; D: distal bulbus
PB: perineal body; if C > under D: neck elongation

RECTAL EXAMINATION

Descending perineum ☐
Basal tone ☐
Mucous palpation ☐
Puborectal bundle ☐
Coughing reflex ☐
Anocutaneous reflex ☐
Pain ☐

Tone of force ☐
Anal yawn (partly open anus) ☐
Valsalva contraction ☐
Perineal sensitivity ☐
Prolapse when forced ☐

Complementary Tests

IMAGE

Defecography ☐
Dynamic pelvis MRI ☐
Cystography ☐
Vaginal Ecography ☐
Endoanal ecography ☐
Anal manometry ☐
Bilateral PNTML ☐
Urodynamics ☐
Hormone levels ☐

incontinence is a very common finding in cases of developed POP.²⁰ However, in the reinterventions of the patients in group C, unpredictability of the behaviour of the biological meshes is confirmed.

In short, isolated, ventral rectosacropepy with mesh for total rectal prolapse, or in combination with colpopexy (or attachment of the uterosacral ligaments or the perineum), for simultaneous prolapse, takes place in one single intervention and uses the same (preferably laparoscopic) approach. The preferred way to carry out this surgery is via solid anatomic repair of the POP and adequate correction of the accompanying dysfunctions, with few complications, consequences or recurrences.

REFERENCES

1. Tou S, Brown SR, Malik AI, Nelson RL. Surgery for complete rectal prolapse in adults. The Cochrane Library. 2008(4).
2. Maher C, Baessler K, Glazener CMA, et al. Surgical management of pelvic organ prolapse in women. The Cochran Library. 2005(3).
3. Altman D, Zetterstrom J, Schultz I, et al. Pelvic organ prolapse and urinary incontinence in women with surgically managed rectal prolapsed: a population-based case-control study. *Dis Colon Rectum*. 2006;49:28–35.
4. González-Argente FX, Jain A, Nogueras JJ, et al. Prevalence and severity of urinary incontinence and pelvic genital prolapse in females with anal incontinence and rectal prolapsed. *Dis Colon Rectum*. 2001;44:929–36.
5. DeLancey JO. Anatomics aspects of vaginal eversion after hysterectomy. *Am J Obstet Gynecol*. 1992;166:1717–24.
6. Bump RC, Mattiasson A, Bo K, et al. The standardization of terminology of female pelvic organ prolapsed and pelvic floor dysfunction. *Am J Obstet Gynecol*. 1996;175:10–7.
7. Hernández P, Targarona EM, Balagué C, et al. Tratamiento laparoscópico del prolapso rectal. *Cir Esp*. 2008;84:318–22.
8. Salomon MJ, Young CJ, Evers AA, et al. Randomized trial of laproscopic versus open abdominal rectopexy for rectal prolapsed. *Br J Surg*. 2002;89:35–9.
9. D'Hoore A, Cadoni R, Penninckx F. Long term outcome of laparoscopic ventral rectopexy for total rectal prolapse. *Br J Surg*. 2004;91:1500–5.
10. D'Hoore A, Penninckx F. Laparoscopic ventral recto(colpo)-pepy for rectal prolapsed: surgical technique and outcome for 109 patients. *Surg Endosc*. 2006;20:1919–23.
11. Karulf RE, Madoff RD, Goldberg SM. Rectal prolapse. *Curr Probl Surg*. 2002;38:762–823.
12. Novell JR, Osborne MJ, Winslet MC, et al. Prospective randomized trial of Ivalon sponge versus sutured rectopexy for full thickness rectal prolapsed. *Br J Surg*. 1994;81:904–6.
13. D'Hoore A, Vanbeckevoort D, Penninckx F. Clinical, physiological and radiological assessment of rectovaginal septum reinforcement with mesh for complex rectocele. *Br J Surg*. 2008;95:1264–72.
14. Slawik S, Soulsby R, Carter H, et al. Laparoscopic ventral rectopexy, posterior colporrhaphy and vaginal sacrocolpo- pexy for the treatment of rectogenital prolapse and mecha- nical outlet obstruction. *Colorectal Dis*. 2008;10:138–43.
15. Collinson C, Cunningham C, D'Costa H, et al. Rectal intussusception and unexplained faecal incontinence finding of proctographic study. *Colorectal Dis*. 2009;11:77–83.
16. Altman D, Zetterström J, Mellgren A, et al. A three-year prospective assessment of rectocele repair using porcine xenograft. *Obstet Gynecol*. 2006;107:59–65.
17. Chen CCG, Ridgeway B, Paraiso MF. Biological grafts and synthetic meshes in pelvic reconstructive surgery. *Clin Obstet Gynecol*. 2007;50:383–411.
18. Blanchrd KA, Vanlangendonck R, Winters JC. Recurrent pelvic floor defects after abdominal sacral colpopexy. *J Urol*. 2006; 175:1010–3.
19. Nygaard IE, McCreery R, Brubaker L, Connolly AM, Cundiff G, Weber AM, et al. Abdominal sacrocolpopexy: A comprehensive review. *Obstet Gynecol*. 2004;104: 805–23.
20. Brubaker L, Cundiff GW, Fine P, Nygaard I, Richter H, Visco AG, et al. Abdominal sacrocolpopexy with Burch coloposuspen- sion to reduce urinary stress incontinence. *N Engl J Med*. 2006;354:1557–66.