Painful ultrasound detected lesion in the proximal part of the corpus cavernosum: A case of so called "partial priapism"?

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DISCUSSION

Performing a Pub Med search with the key word "*Partial priapism*" or "*Segmental priapism*" we founded 55 cases, reporting different etiologic hypothesis. Therapeutic management was conservative or invasive with different medication or technique applied (Table 1, 2). During the time, from the first case described by *Hillis* (2), in which treatment option was an incision, irrigation of corpus cavernosum with the excision of a thin membrane localized between normal and affected tissue, the choice about treatment not seems related to a precise indication. Instead, the therapeutic management was related to increased knowledge of this clinical entity . In fact, in the early years, it was more frequent the choice of an invasive approach regardless of the clinical response to medical therapy. Only recently, the use of invasive procedures and surgery was reserved for situations of unresponsiveness to treatment of symptoms. Several cases had been recently reported. *Del Villar et al.* (3) presented a case of a 22-year-old patient, with no history of trauma or medical or surgical treatment, complaining right testicle and penile base pain on erection for 15 days. Erectile function was referred as not altered. Use of drugs or intracavernosal injection was denied. On physical examination patient exhibited stiffness of the right corpus cavernosum at the base of the penis and the crural area, with mild tenderness on in-depth palpation. Patient's blood tests were normal. The Doppler ultrasound examination revealed an increase in the entire right crus of the corpus cavernosum due to the presence of sinusoids involving liquid content without internal Doppler flow. Authors performed a gadolinium-enhanced Magnetic Resonance (MRI) revealing corpus cavernosum asymmetry with a larger volume of the right proximal segment and spontaneous T1 hyper- intensity and a 7,5 cm T2 hypo- intense image consistent with segmental cavernosal thrombosis. A conservative management was indicated with 375 mg daily of acetylsalicylic acid (ASA) plus gastric protection with omeprazole over a period of two weeks. After one month, patient's condition remained unchanged. *Phillips et al.* (4) presented a case of corpus cavernosum hematoma mimicking priapism in a 42-year-old man. Examination revealed partial erection and palpable space-occupying lesion of the corpus cavernosum without lymphadenopathy. Malignant workup was negative. Imaging assisted in diagnosis of unilateral hematoma of the corpus cavernosum. The lesion spontaneously resolved without the need for intervention. *Kropman and Schipper* (1) described a case of a 38- year-old caucasian male complaining a one day history of perineal discomfort and a swelling at the right base of his penis started during a prolonged car drive. To make a diagnosis, they performed an ultrasound perineal evaluation and than a MRI with evidence, in T1 and in T2 weighted signal intensities. a mass of 2 × 7 cm in the proximal part of the right corpus cavernosum with a well-defined abrupt change to the normal distal part. No enhancement of the mass after contrast injection with gadolinium was seen, suggesting absence of flow. The patient was prescribed diclofenac 50 mg 4 dd for the pain and the swelling. At a follow-up of one month the pain had become much less. After half a year the patient had no complaints. Recently, in a multicentre retrospective analysis, *Weyne et al.* (5) presented 15 cases of idiopathic partial thrombosis (IPT). Patients most frequently presented with perineal pain and swelling or pain during erection. Most patients reported being a frequent cyclist with the episode of IPT occurring after cycling activity. Clotting tests (raised D-dimers in 40% of cases), ultrasound and MRI were performed in all cases. The authors underlines the need of MRI evaluation in diagnostic work up because of the possibility to diagnose a "*cavernous web*" which was a common findings in almost all patients. Therapy was initially conservative (low molecular weight heparin in prophylactic or therapeutic dose) with concomitant or consequent anti-aggregant therapy. Complete resolution was observed in most of the cases. In case of failure, surgical incision of the web with saphenous graft repair or Heincke Mikulicz reconstruction was performed with good functional outcome.
Cooper et al. (6) published a case of partial priapism in a 26 years old man presented to the emergency department with severe, right-sided perineal pain of 24 hours duration. He denied any trauma but did have mild dysuria. Computed tomography (CT) of the pelvis showed asym-

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Table 1.
Cases of "partial" or "segmental" priapism treated by an operative approach and listed per years of publication.

Reference	Year of pubblication	Age (years)	Race	Possible etiology	Side affected	Laboratory results	Instrumental work up	Type of operative management	Follow up
2	1976	24	Black	Idiopathic	Prox Left/right	Normal	Ultrasound ecocolordoppler/ Gadolinium-MRI	Incision, irrigation, excision membrane	Complete recovery
16	1976	34	Caucasian	Prolonged sexual intercourse	Prox right	Normal	-	Exploration, irrigation	Complete recovery
9	1980	23	Caucasian	FUO since 2,5 years	Prox left/right	Normal	-	Compression, irrigation, shunt	Recovery
5	1980	34	Caucasian	Prolonged sexual intercourse	Prox right	Normal	-	Incision, irrigation, excision membrane (Thrombosis)	Recovery
27	1981	-	-	Idiopathic	-	-	-	Incision	Recovery
17	1985	21	-	Idiopathic	Prox left	Normal	CT scan	Exploration, biopsies (Thrombosis)	Complete recovery
18	1986	27	Caucasian	Idiopathic	Prox left	Normal	-	Evacuation, irrigation	Complete recovery
23	1988	24	-	Congenital spherocytosis-no trauma	Prox left	-	Cavernosography/ CT scan	Incision (hematoma evacuation) 5 weeks after symptoms onset and saline/heparin irrigation	Recovery
24	1993	34	-	Idiopathic	Prox left and right	-	-	Incision/exploration after NSAID and LMHW i.v.	Complete recovery
22	1995	47	-	Idiopathic	Distal, midline	Normal	Ultrasound ecocolordoppler	Incision (evacuation of organizing hematoma)	No palpable residual mass
12	1997	29	-	Idiopathic	Prox right	Normal	-	Puncture of right crus, saline irrigations, ethylephrine injection	Complete recovery
15	1998	44	-	Long bicycle ride the day before	Prox left	Normal	-	Puncture of left crus, LMHW i.v. for 15 days, aspirin for 6 months	Complete recovery
19	1999	24	Caucasian	Prolonged erection 2 days before	Prox left	Slighty elevated white blood count	CT scan/ MRI	Incision, membrane resection	Decrease of symptoms, scar formation
20	2001	33	-	After sexual intercourse- no trauma	Prox left	Urine test positive for cannabinoids	-	Exploration, irrigation, shunt after unsuccessful intracavernous injection of phenylephrine	Complete recovery
20	2001	24	-	After sexual intercourse- no trauma	Prox left and right	Positive for Sickle cell test	-	Cavernosal-spongiosum shunt	Post operative erectile dysfunction resolved later
21	2004	32	Caucasian	Bicycle ride (mountain bike) the day before-no trauma	Prox right	Normal	Ultrasound/ MRI	Surgical exploration (hematoma evacuation)	Recovery
26	2009	-	-	Tamsulosin 0,4 mg used the day before	-	-	-	Incision	Complete recovery
8	2012	51	Caucasian	Idiopathic	Prox left and right	-	Ultrasound ecocolordoppler/ MRI	Intracavernous injection of ethylephrine and acenocoumarol (60 days)	Incomplete recover of erectile function (treated with PDE5
25	2013	50	Caucasian	Sildenafil 100 mg used the day before	Prox left	-	-	Surgical incision and clot evacuation (unresponsiveness to analgesics)	Complete recovery
5	2015 **	-	-	Cyclist riders	-	D-dimers elevation	Ultrasound/ MRI	Surgical incision and saphenous graft repair	4 of 15 patients surgically treated

***case series of 15 patients.*

metric enlargement of the proximal right corpus cavernosum with an area of thin hyperdense tissue distal to the enlarged region. After a first discharge with antibiotic therapy (ciprofloxacin), the patient returned to the hospital three days later complaining worsening of right sided perineal pain. The repeat pelvis CT showed the sane picture, with a hyperdense membrane distal to the right proximal corporal thrombosis. At this time, the therapy was also conservative whit prescription of ibuprofen 800mg three times daily, acetylsalicylic acid 325 mg daily and pentoxifylline 400mg twice daily. After six weeks of therapy and at three months follow up, a complete recovery was observed.

The patient referred no impairment of sexual function and no relapses of symptoms. *Also Gresty et al.* (7) presented two cases managed conservatively. Although both patients reported resolution of local symptoms, formal analysis of sexual function at follow-up review has revealed that only one achieved complete recovery. In general, a painful perineal mass was the recurrent symptom of presentation in each case described in literature. The cause of this condition remains unclear. When surgery was the therapeutic option, a thin membrane was found that separated the erect from flaccid part of the corpus cavernosum (2-4-5). It is unclear if this findings was expression of an innate web predisposing to develop the thrombus, as suggested by *Hillis et al.* (2) or if this fibrous septum was consequence of a traumatic event (3). But how to explain partial priapism when patient history is negative for trauma (e.g. during sexual intercourse or cycling)?. As it was in our case, patient referred an acute onset of symptoms without any related event. Thus, such in others experiences reported in the literature (see references on Tables 1, 2) , the etiology of the presented case was unclear and must be considered idiopathic. Instrumental investigations for diagnosis was mandatory. In case of clinical findings suggesting for this condition, perineal ultrasound with color Doppler evaluation may lead to demonstrate the initial hypothesis of partial or segmental priapism. In our opinion, ecocolorDoppler may be the only instrumental diagnostic

Table 2.
Cases of "partial" or "segmental" priapism managed with conservative approach and listed per years of publication.

teference	Year of pubblication	Age (years)	Race	Possible etiology	Side affected	Laboratory results	Instrumental work-up	Therapy	Follow up
29	1988	51	-	No trauma	Prox left	-	Ultrasound ecocolordoppler/ GadoliniumMRI	No therapy	Decrease of symptoms
29	1988	37	-	No trauma	Prox left	-	Ultrasound ecocolordoppler/ Gadolinium MRI	No therapy	Decrease of symptoms
6	1994	27	Caucasian	No trauma	Prox right	Normal	Ultrasound ecocolordoppler/ Gadolinium MRI	Aspirin, propoxyphene	Complete recovery
30	1998	35	Caucasian	No trauma	Prox left	Elevated white blood count	Ultrasound ecocolordoppler/ MRI	Heparin i.v., Acetylsalicylic acid	Complete recovery
10	2002	46	-	No trauma	-	Liver enzymes slighty increased	Ultrasound ecocolordoppler/ Gadolinium MRI	Heparin i.v. 30000IU/24h,later acetylsalicylic acid 100 mg/day	Fibrous residium at MR and ultrasonography o follow-up; erectile function conserved
14	2003	18	Caucasian	After cycling, no trauma	Prox right	Normal	Ultrasound ecocolordoppler/ Gadolinium MRI	LMWH	Complete recovery
14	2003	22	Caucasian	After airplain flight, cyclist	Prox left	Normal	Ultrasound ecocolordoppler/ Gadolinium MRI	Acetylsalicylic acid	Complete recovery
14	2003	27	Caucasian	Cyclist	Prox right	Normal	Ultrasound ecocolordoppler/ Gadolinium MRI	Acetylsalicylic acid	Complete recovery
7	2005	37	-	Cocaine and marijuana abuse on day of onset of symptoms	Prox right	Urine test positive for Cocaine and cannabinoids	-	Pain medication,hydration	Complete recovery
31	2009	22	-	-	Prox left	-	MRI	NSAID, aspirin	-
28	2011	32	Caucasian	Sexual arousal without intercourse	Prox right	Slightly elevated white blood cells count,	Ultrasound ecocolordoppler	15,000 IU of dalteparin daily, given subcutaneously	Recovery
32	2013	19	Caucasian	Mountain biking	Prox right	Normal	MRI	LMWH and NSAID	Proximal fibrosis
32	2013	32	Caucasian	Masturbation	Prox left	Normal	MRI	LMWH and aspirin	-
32	2013	35	Caucasian	Transatlantic flight and biking	Prox right	Normal	MRI	LMWH and aspirin	-
33	2014	23	Caucasian	-	Prox bilateral	Normal	CEUS, MRI	Enoxaparin 40 mg once daily and acetylsalicylic acid 100 mg once daily	Complete recovery
1	2014	38	Caucasian	2-hour car drive; sexual intercourse the night before onset of symptoms	Prox right	Slightly elevated K+	-	NSAID	Complete recovery
3	2014	22	-	Idiopathic	Prox right	Normal	Ultrasound ecocolordoppler/ Gadolinium MRI	Acetylsalicylic acid 375 mg daily for two weeks and than 100 mg for maintenance	Recovery
4	2015	42	Caucasian	-	Prox right	Normal	Ultrasound ecocolordoppler	No therapy	Complete recovery
sent case	2015	52	Causasian	Idiopathic	Prox right	Slight elevated white blood cell count	Ultrasound ecocolordoppler	NSAID,Analgesic	Complete recovery with residual hyperechoic lesion
5	2015**	-	-	Cyclist riders	-	D-dimers elevation	Ultrasound/ MRI	LMWH	-
6	2015	26	Caucasian	Idiopathic	Prox right	-	CT	NSAID (ibuprofen 800 three times daily) Pentoxiphylline 400 twice daily Acetylsalicylic acid 325 mg daily (for six weeks)	Complete recovery without sexual dysfunction
7	2015	-	-	-	-	-	-	-	Complete recovery of sexual function in one two patient

***case series of 15 patients.*

method considering that MRI or Computed Tomography or cavernosography or contrast enhanced ultrasound has not added relevant diagnostic elements in each case in which they were employed (see references on Tables 1, 2). Ultrasonographic features, consisting in hypo-anechoic areas without visible blood flow, may be considered pathognomonic (1, 2, 12, 13). Therefore, invasive diagnostic methods should be avoided also in consideration of the fact that the sudden onset of the phenomenon is unlikely related to a tumor of the penis (14) which however is very rare in the proximal part of the corpus cavernosum.

The therapeutic options proposed include: conservative management, surgical corporotomy, cavernosum-spon-

giosum shunt and intracavernous injection of ethylephrine (11, 15).
In our reported case we opted for a conservative approach preferring symptomatic and anti inflammatory drugs to systemic anticoagulants due to the risk of low molecular weight heparin induced priapism due to heparin-induced thrombocytopenia (16). Operative treatment should be implemented only in selected cases (5, 8, 9, 16). As suggested by *Kropman and Schipper* (2), although partial priapism is the commonly used term to characterize this unusual clinical condition, we believe that symptoms and imaging findings are related to an interstitial hematoma rather than to a real priapism, especially in case of idiopathic etiology.
In fact, if during a low flow priapism all sinusoids of the corpus cavernosum are dilated and completely filled by venous blood, why only a part of the corpus should be involved? On the other hand, in case of high flow priapism, the flow of blood is constant and it presents no abrupt stop. The "*septum*" described by some authors (3, 5, 12) may be related to a traumatic event and is not justifiable in cases without precise origin. In addition, how to justify the partial thrombosis theory (9-11) if patients were in most cases able to maintain its erectile ability? We believe that in our reported case, symptoms and ultrasound findings were related to an interstitial hematoma as well as demonstrated by the ultrasound evolution of the hypo-echoic lesions which become hyper-echoic after a few days from the onset of symptoms.

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