

# What's Your Diagnosis?®

## Sharpen Your Physical Diagnostic Skills

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### HISTORY

A 71-year-old man with diabetes seen on transfer to a rehabilitation unit after transmetatarsal amputation of left foot. Gangrene had occurred despite surgical revascularization. Postoperative volume depletion and prerenal azotemia cleared with intravenous fluids and modulating medications. Never required dialysis. No history of penoscrotal problems or symptoms in past.

### PHYSICAL EXAMINATION

Man lying flat without orthopnea. No anasarca. Visible portions of scars free of dehiscence, erythema, or pus (surgeon insists that amputation site dressing not be removed except in his presence). Penis and scrotum as shown. Sharply localized pain on underside of scrotum but no erosion or ulcer; manipulation of grossly swollen genitalia difficult and causes pain. Urine in collection bag normal.

WHAT'S YOUR  
DIAGNOSIS?



## What's Your Diagnosis?

**ANSWER:** SEVERE  
PENOSCROTAL  
EDEMA

Penile edema of massive severity makes a vivid first impression. In addition, the scrotum is distended to a degree otherwise expected only in a case of hydrocele or filariasis with elephantiasis. The skin at the inferior margin of the penile glans is so deformed that one cannot determine if it is glans proper or prolapsed swollen skin forming a broad, deep shelf near the meatus and the exit site of the urethral catheter (Figure 1).

### WHY NO MORE DRASTIC CONSEQUENCE?

The penile swelling was so extreme that we worried about necrosis from swelling-related interference with arterial inflow, in the fashion of a compartment syndrome. Our review of the literature supported this fear in that the many images available of penile edema do not approach the extremity observed here.

One can speculate that normal erectile distensibility of the organ, and the plications of the skin that allow this, worked in our patient's favor.

Perhaps the same explanation accounts for why no break in the skin occurred, nor a more catastrophic bursting of the skin akin to a sausage on a fire—an analogy that we know is offensive but that conveys the visualization of our worries quite precisely.

Over the next month we provided and oversaw meticulous skin care. No interventions were utilized apart from scrotal elevation and application of mupiro-

cin to a tiny area of injury at the margin of the urethral meatus; the swelling eased and finally disappeared (Figures 1 through 9).

The glans continued to appear bilobar for a time (Figure 2). The shelf-like portion eventually was recognized as having been merely skin, not a portion of glans; why it had been even more edematous than other nearby tissue remained a mystery.

Because his phallus was still substantially longer than common for age and habitus, we asked his very proper and observant wife, a registered nurse, if this were the ordinary pre-morbid shape of this part of his body, and she confirmed this.

### WHAT ABOUT URINARY EXTRAVASATION?

When the integrity of the penile urethra is lost, often via a catheter that penetrates the wall, urine spreads into the surrounding tissue and causes severe irritation and swelling. This is termed *periurethral phlegmon*<sup>1</sup> and was a consideration. However, the area was nontender—and he was not so neuropathic as to be insensitive to lower-body noxious stimuli. The penis was not red; its inferior surface, close to the urethra, showed no exaggeration of any deformity as compared with the rest of the organ. So we dismissed this inflammatory condition. Records from the hospitalization preceding his transfer to us did not include any mention of trouble with a catheter, but also did

not acknowledge penile swelling. We don't think swelling evolved en route to our facility in the ambulance. The patient's devoted daughter, like her mother a registered nurse, reported that swelling began several days earlier and was treated with elevation alone.

### VASCULATURE: VENOUS AND LYMPHATIC

As we tried to make sense of all this, we noted that adjacent areas of limbs and lower abdomen were not swollen. So the process could not be attributed to *inferior vena caval occlusion*; the penis was not erect, rendering the prospect of *priapism* with penile vein thrombosis impossible; furthermore, such a hypothesis



Figure 1 – In view from right side of bed, penis and scrotum are both grotesquely swollen; patient's left thumb serves as constant "ruler" or marker in this and several following images. Revascularization wound is scabbed but not open. Catheter exits from an area where inferior tissue extends beyond penile shaft and glans.



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Figure 2 – Four days later, swelling has markedly diminished, though is still severe. Glans penis still looks bilobed. Wrinkling of penile skin has begun to reappear, and the shaft does not completely cover the scrotum. Scabs at suture line continue to diminish.

would not account for scrotal swelling. We know of no locus of venous or lymphatic blockage that would produce this anatomical distribution of swelling.

Localized *congenital or acquired lymphedema* of the penis has been reported,<sup>2,3</sup> but not with abrupt onset after surgery that has not been performed on the genitals themselves.

### SEXUALLY TRANSMITTED DISEASES AND OTHER INFECTIONS

One considers *sexually transmitted diseases* in the differential diagnosis of any genital swelling<sup>4</sup>; this patient was not forthcoming about sexual function or partners. One formed an impression from him and his devoted family that he had not strayed; nor could one envision him initiating sexual contact and completing genital intercourse with his degree of vascular and cognitive compromise. Nor is there any conventional sexually

transmitted disease marked by severe local edema as the solitary manifestation. For the same reasons, non-infective abrasion-related *penile venereal edema*, whether from protracted and repeated unlubricated intercourse, or from relentless masturbation for hours a day, was excluded.<sup>5,8</sup>

*Necrotizing perineal infection* including Fournier gangrene could cause terrible swelling, but inflammation should be severe until it turns black from necrosis.<sup>9</sup> No such feature is seen here. While methicillin-resistant *Staphylococcus aureus* is endemic, in the absence of more overt local inflammatory features, we gave it scant thought; likewise, the patient's freedom from features of systemic inflammation would be inconsistent with raging infection.

A *local fungal skin infection* could certainly produce sparse symptoms and no systemic features. We have seen many such infections.



Figure 3 – Podiatric surgeon left instructions, written directly on the outside of the bandaging, that no one but he remove dressing over amputation site. No malodor or soaking of this dressing was detected.



Figure 4 – Three days later still, glans has resumed recognizable configuration, though is still more shiny and less grainy than this structure usually appears. Shaft is still swollen but ever less so; scrotum appears reduced almost to normal size. Scabbing has progressively diminished at suture line. Small meatal erosion or expansion caused by urethral catheter is marked by gap medial to catheter in this view.

minute focus analogous to a perianal fissure in being invisible but painful), but not to the penis nor the rest of the scrotum.

#### WHY IS IT NOT DIALYSATE?

Many persons who receive *peritoneal dialysis* have experienced gravitational flow of dialysate into the scrotum, either via the inguinal canals through a pathologically patent processus vaginalis or an overt hernia, or through the abdominal wall.<sup>11,12</sup> Nuclear medicine tracers have delineated which mechanism applies in certain diagnostically puzzling cases.<sup>13</sup> We excluded this prospect because our patient never had either ascites or renal replacement therapy of any type, including peritoneal dialysis.

One could wonder whether the genital swelling were merely a portion of an *anasarca* from protein loss or other mechanism (eg, excess fluid repletion intraoperatively). However, the rest of the body was not swollen. Rare case reports have suggested penile swelling in uremia apart from anasarca,<sup>14</sup> but our blood work refuted this possibility.

#### BIZARRE POSSIBILITIES

*Acute idiopathic scrotal edema* has occurred in boys, and more rarely in grown men<sup>15</sup> and a variant of this is thought capable of affecting the penis alone.<sup>16</sup> Time course of resolution does not fit the present case at all.

*Crohn disease* can involve the penis and cause otherwise inexplicable swelling.<sup>17</sup> Our patient had no such

diagnosis nor symptoms that would support it. Furthermore, his penile swelling resolved without any measure that would ease inflammatory bowel disease.

Penile swelling can be part of *angioedema*<sup>18</sup> or *contact dermatitis*.<sup>19</sup> However, scrotal swelling would not be expected, or would be confined to areas in contact with an irritant. None of his medicines were stopped be-



Figure 5 – Ten days thereafter, the phallus seems shinier and less wrinkled though no wider; the glans is more grainy and less shiny; the suture line is ever clearer.



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**FILE UNDER:** Genital examination

Cross-References: Examination of localized swelling, severe  
Postoperative examination



Figure 6 – Correspondingly, distal part of suture line continues to heal.

fore this cleared. Penile angioedema from angiotensin-converting enzyme inhibitors and angiotensin receptor blockers has typically been confined to mid-shaft,<sup>20</sup> and that is unequivocally not the pattern here.

Seasonal *arthropod bites* have been reported to cause a “summer penile syndrome” (!),<sup>21</sup> which is rapidly excluded by noting that the patient had been indoors in a surgical unit for some time when the process began, and had not the minutest evidence of insect bites or other trauma to the involved tissues.

A *constricting hair* that, unrecognized, becomes wrapped around the penis is another source of selective swelling, usually of the glans,<sup>22</sup> but could not apply here; no ligature was found anywhere, let alone encompassing both the root of the penis and the base of the scrotum. *Paraphimosis* is an intrinsic process whereby a disordered retracted prepuce in an uncircumcised boy or man strangulates the glans, but can be excluded immediately based on anatomic distribution.<sup>23</sup>

### BEST MATCH ALBEIT IMPERFECT

Two other precedents may or may not represent the process responsible for our patient's edema: 2 patients with diabetes developed lesser but similar swelling, immediately after leg amputations.<sup>24</sup> We are not convinced of parallelism because both those amputations were not for dry gangrene, as here, but rather for infected non-

perfused feet. Of note, neither such patient had evidence of spread of infection proximal to the amputation site, let alone up to the scrotum; nor was either case clinically one of necrotizing fasciitis. In both instances, resolution occurred spontaneously, considerably more rapidly than in our patient.

### UNANSWERED QUESTIONS

Our leading question is, what happened and why? We have a host of suspects, but no conclusion. We prefer not to fall back on the dictum in geriatrics that problems are so often multifactorial. We prefer resolution without understanding over perfect comprehension of an ineluctable decline. But we would also

like to know what took place. Any readers who have seen similar cases or read about them in the literature—though we have sampled the literature exhaustively—are asked to share information.

Another issue is why not all penile enlargement produces erection: this patient's penis was swollen far beyond the extent normally produced by erection. We can't understand why the 100 mL or more of fluid that had left the vas-



Figure 7 – When we finally have the chance to see the amputation site, the surface is clean and dry; the yellow-orange discoloration was transient, not associated with features of inflammation, and innocuous. Foot just proximal to this is clearly viable and not swollen.



Figure 8 – A little more than a month after amputation, 3 and a half weeks after transfer to our facility, the penis finally looks normal in caliber, and the healed suture line is reduced to a crease.



Figure 9 – Asymptomatic erythema of the slightly enlarged meatus is still seen at this point, but did not call for antibiotic therapy.

cular space, whether or not it remained within the cavernous spaces, did not cause the penis to become hard.

#### ENTIRE PATIENT

While changes in the penis resolved, the suture line from revascularization continued to heal without incident (Figures 6 and 8). The dressing on the foot, once zealously guarded by the surgeon (Figure 3), was able to be removed, and the amputation site remained intact, viable, and free of infection though curiously discolored (Figure 7). Our patient regained considerable mobility as the physical and occupational therapists worked with him on reconditioning and on adaptive exercise and orthotics post amputation. Diabetes mellitus and hypertension were attended to, and he returned to his home, with services, to the great pleasure and gratification of all. ■

Schneiderman H, Haller HS. Exceptionally severe penoscrotal edema, with complete resolution, after foot amputation in an elderly diabetic man. *CONSULTANT*. 2008;48:1051-1059.

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