CASE REPORT

Hypervascularity of the glans penis diagnosed with cutaneous temperature measurements

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Hypervascularity of the penis is a complication that has been described after deep dorsal vein arterIALIZATION. We present a patient with hypervascularity of the penis which was diagnosed with cutaneous temperature measurements of the penis. Our patient underwent both pre- and post-operative cutaneous temperature measurements taken at seven locations along the shaft and glans of the penis with the Physitemp BTE-2A Thermal Sensitivity Tester. After deep dorsal vein arterIALIZATION our patient’s cutaneous temperature at the glans increased 4.2°C. After ligation of the distal deep dorsal vein for hypervascularity, the cutaneous temperature at the glans decreased 1.3°C.

We present a novel technique using cutaneous temperature measurements which may be used as a test for the efficacy of arterial revascularization and its potential complications.

Keywords: hypervascularity; penis; cutaneous; temperature

Introduction

The NIH consensus panel defined erectile dysfunction (ED) as the inability to achieve or maintain an erection sufficient for satisfactory sexual performance.1 ED is a disease with multiple etiologies including vascular, psychological, neurological, endocrine and mixed causes. By far, impotence related to arterial insufficiency is considered the most prevalent. In an effort to avoid prosthesis, injection therapy, or medications, young patients with vasculogenic impotence have undergone revascularization procedures to restore normal function.2,3 Deep dorsal vein arterIALIZATION (DDVA) is one technique that has been used successfully.2,3 Despite the success of DDVA, complications have been known to occur. In particular, hypervascularity of the penis has been described in 12.5% of Virag’s patients typically within 10–15 days after the operation.2 Delayed onset of hypervascularity of the penis has also been described.4

The diagnosis of hypervascularity is typically based upon physical examination of the glans, with the use of duplex ultrasound, dynamic infusion cavernosometry and cavernosography, or arteriography as supporting evidence. We present a patient with hypervascularity of the penis that was diagnosed by determining the cutaneous temperature measurements of the glans.

Case Report

A 22-y-old college student was referred for a erectile dysfunction evaluation after one episode of penile pain, without evidence of swelling or ecchymosis, during a week long vacation with intercourse twice a day. The patient subsequently noticed difficulty achieving erections with sexual stimulation and masturbation. Our patient reported no evidence of nocturnal erections. The rest of his medical history was noncontributory with no medical illnesses, surgeries, or medications. Physical examination revealed a well-formed phallos, testicles of normal caliber and an intact neurologic exam. Serum testosterone, liver function tests and basic chemistries were all within normal limits. Penile plethysmography was normal.

The patient was initially tried on a trial of sildenafil. The patient reported that his erections improved with medication, but still were not sufficient. At this point the patient was referred for a vascular evaluation. The patient subsequently underwent duplex ultrasound evaluation of the penis. This revealed a peak systolic velocity after 0.2 cc Trimix of 31 mm/s on the right and 20 mm/s on the left. The patient did not develop a normal erection with
0.2 cc of Trimix. Nocturnal penile tumescence study performed over two nights was abnormal with a best tip rigidity of 44%. The patient subsequently underwent a pudendal angiogram that demonstrated a single attenuated right deep penile branch with no evidence of a left penile arterial branch.

All of the options for erectile dysfunction including continued medical treatment, vacuum constriction devices, injection therapy, artificial prosthesis and arterIALIZATION of the deep dorsal vein were thoroughly discussed. A decision was made to proceed with arterIALIZATION of the dorsal vein with the inferior epigastric artery. The patient had preoperative cutaneous temperature measurements taken with the Physitemp NTE-2A Thermal Sensitivity Tester (Physitemp Instruments, Clifton, NJ). Measurements were reported as the average of three measurements taken along the left and right lateral penile shaft, and the dorsal midline of the circumcized glans (Figure 1a). The patient underwent an uneventful arterIALIZATION of the deep dorsal vein with the inferior epigastric artery and was discharged from the hospital on postoperative day 2 with aspirin and pain medications.

The patient returned for follow-up one week later with complaints of penile pain and mild complaints of difficulty with urination. Physical examination at this time demonstrated an edematous glans with a modest blue color. Repeat cutaneous measurements at the penis demonstrated a significant increase in temperature at all locations tested (Figure 1b). Conservative management of watchful waiting was chosen and the patient was instructed to return in one week. At this time the patient reported continued pain at the glans and worsening lower urinary tract symptoms of frequency, urgency, decreased force of stream and post-void dribbling. Repeat cutaneous measurements demonstrated persistently elevated temperatures (Figure 1c). The patient underwent a duplex ultrasound which demonstrated an increased blood flow to the penis at rest. These examinations were consistent with hypervascularity of the glans.

The patient underwent an uneventful operative repair with ligation of the distal deep dorsal vein, as well as the newly formed collaterals. The patient was followed post-operatively and measurements were performed again at post-operative week 7 (Figure 1d). The patient currently has improved erections.

Discussion

Young patients with vasculogenic impotence often choose to have penile revascularization to avoid the use of prosthesis, injection therapy and medication use. Deep dorsal vein arterIALIZATION is one technique that has been used successfully.²,³ Although arterIALIZATION is usually successful, complications have been know to occur. One complication inher-

ent to this particular operation is hypervascularity of the penis.²,⁴ We report a patient who underwent deep dorsal vein arterIALIZATION, complicated by early hypervascularity of the penis, who had cutaneous temperature measurements obtained throughout his treatment course.

Penile skin temperatures have been used for the evaluation of impotence and male erectile responsiveness to aging.⁵,⁶ Solnick reported that the mean surface temperature 1 inch proximal to the dorsal coronal ridge of the flaccid penis for old and young groups was around 91.7°F (33.2°C) to 92.8°F (33.8°C), respectively.⁵ A recent report by Bleustein demonstrated a normal glans temperature to be 31.8°C.⁷ Our patients pre-operative measurements are consistent with these reports. After revascularization, our patient had a 4.2°C increase in temperature at the glans. This increase is much greater than typically seen with normal erections⁵,⁶ and is consistent with the temperature of a fully erect penis.

After ligation of the distal deep dorsal vein and collateral vessels, our patient had a drop in the cutaneous temperatures to more normal levels with resolution of his hypervascularty complaints.

We present a novel technique for diagnosis of hypervascularity of the penis. Cutaneous temperature measurements may be another supportive test for the efficacy of arterial revascularization and its potential complications. Further study of this technique may offer an easy to perform, office-based, non-invasive method for assessing the blood flow after arterIALIZATION of the deep dorsal vein.

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References