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Case Report

Stromal lipofuscinosis of the seminal vesicle: Incidental finding in two patients treated for prostatic adenocarcinoma by prostatectomy and cryotherapy

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ABSTRACT

Stromal lipofuscinosis of the seminal vesicles has been described in only one prior report as an incidental finding in two patients who underwent prostatectomy for prostatic adenocarcinoma. We report two additional cases of lipofuscinosis occurring in the seminal vesicle stromal cells, identified incidentally in two patients treated for prostatic carcinoma by radical prostatectomy and cryotherapy, respectively. A 50-year-old patient had prostatic carcinoma, Gleason Score 3 + 4 = 7 (Grade group 2) on needle biopsy. At radical prostatectomy, a marked stromal lipofuscinosis was identified in both seminal vesicles, but was not found in the prostatic tissue. The second case was a 74-year-old patient in whom stromal lipofuscinosis was identified in one of the targeted biopsies of the seminal vesicles, as part of the surveillance post-cryotherapy assessment. The patient underwent cryotherapy 36 months previously for prostatic carcinoma, Gleason score 3 + 4 = 7/10 (Grade group 2). The stromal lipofuscinosis seen in the first case was more florid and extensive compared to the focal and more discrete lipofuscinosis, found in the patient treated by cryotherapy. Both patients had no prior history of a malabsorption syndrome, or exposure to a common pharmaceutical agent. Stromal lipofuscinosis represents an extremely rare, incidental and idiopathic finding in patients treated for prostatic carcinoma. This report also documents the first example of stromal lipofuscinosis observed in a post-cryotherapy treatment setting.

1. Introduction

Lipofuscin is classically deposited as intracytoplasmic pigmentation in the epithelial cells of the seminal vesicles. In contrast, stromal lipofuscinosis of the seminal vesicle was previously described in only one report, as an incidental finding in two patients who underwent prostatectomy for prostatic adenocarcinoma [1]. Schned et al. documented a prominent seminal vesicle stromal pigmentation in two 51-year-old patients, which was discovered incidentally in prostatectomy specimens performed for prostatic adenocarcinoma [1]. This pigmentation was considered to be of uncertain etiology, as no relevant medical or other history or association was noted in these patients [1]. In this report, we describe 2 additional cases of seminal vesicle stromal lipofuscinosis, identified incidentally in patients treated for prostatic adenocarcinoma. One case represented a florid and extensive stromal lipofuscinosis of the seminal vesicles, found in a prostatectomy specimen, while in the second case, stromal lipofuscinosis was focal and more subtle, and was found in a surveillance biopsy of a patient treated by cryotherapy.

2. Case reports

2.1. Case 1

A 50-year-old male with a serum PSA of 4.0 ng/mL had a hard left-sided prostatic nodule on rectal examination. Needle biopsy of the prostate showed prostatic adenocarcinoma, Gleason score 3 + 4 = 7/10 (Grade group 2), present in 3 of 12 cores. His past medical history included psoriasis, shoulder and knee injuries, right inguinal hernia repair, and vasectomy. Of note, the patient used Percocet for chronic joint pain, but had no known bowel malabsorption abnormalities or a documented vitamin deficiency. He underwent a radical prostatectomy 6 months after the biopsy. Macroscopic examination of the seminal vesicles revealed normal bosselated contours of normal sized vesicles that had a homogeneous tan color; of note, there was no grossly noticeable

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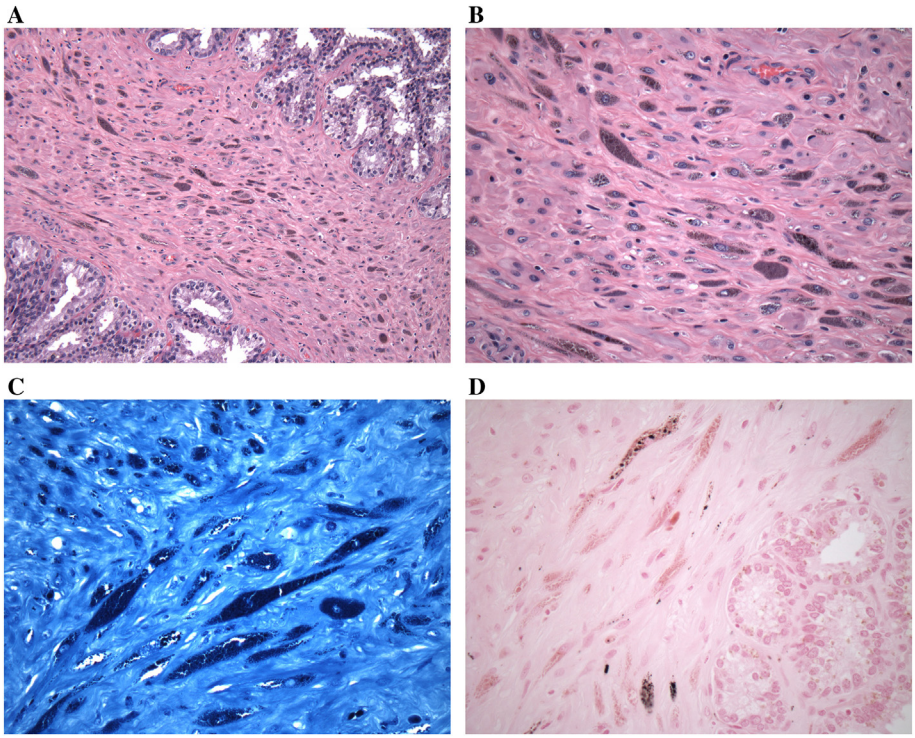

Fig. 1. Case 1. A. An extensive pigment deposition was present in the stromal cells of the muscular coat of the seminal vesicle (H&E ×100). B. The dark-to-mustard brown pigment showed variable granularity and focally obscured the nuclei. It was similar to the lipofuscin pigment in the seminal vesicle epithelium, but it was darker (H&E ×200). C. The pigment was reactive for Giemsa (Giemsa ×400). D. The pigment shows focal reactivity for Masson-Fontana (this stain can show variable staining for lipofuscin), but Masson-Fontana treated with bleach was negative (not shown) (Masson-Fontana ×400). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

discoloration. The prostatectomy specimen was sampled completely, and demonstrated organ-confined prostatic adenocarcinoma (stage pT2), Gleason score 3 + 4 = 7/10 (Grade group 2), with negative surgical margins. There was an incidental finding of diffuse, marked and bilateral granular pigmentation, dark-to-mustard brown, and located in spindled stromal cells of the muscle walls of the seminal vesicles (Fig. 1A–B). No stromal pigment was noted in the ejaculatory ducts or in the prostate gland stroma. The pigment was similar to the lipofuscin pigment of the seminal vesicle epithelium, but it was darker, showed coarser granularity, and focally obscured the nuclei. There was no associated inflammation, fibrosis, vascular changes or other significant findings. The pigment was reactive for Periodic Acid-Schiff (PAS) with and without diastase, Giemsa, and focally for Masson-Fontana and Luxol fast blue (Fig. 1C–D). The pigment deposits were negative for iron (Perls' Prussian blue) and for Masson-Fontana treated with bleach. Immunohistochemical testing to clarify the nature of the pigment location (stromal cells versus histiocytes) was performed with the following stains: actin (DAKO Denmark, clone 1A4, prediluted), desmin (DAKO clone D33, prediluted), CD1a (Cell Marque, Rocklin, CA clone EP3622, prediluted), CD68 (DAKO clone KP1, prediluted), CD117 (DAKO polyclonal, diluted 1:400) and S100 (DAKO clone GA504, prediluted). Immunohistochemical stains highlighted the lipofuscin deposition in the stromal muscle cells, which were reactive for smooth muscle actin and desmin. Pigmented spindled cells were negative for CD68, S100, CD1a and CD117, refuting pigment deposition in histiocytes and neural crest derived cells, respectively. No other sites of visible external pigmentation were documented. Eight months after the surgery the patient remained free of complications.

2.2. Case 2

A 74-year-old male with a serum PSA of 8.1 ng/mL had a biopsy proven Gleason score 3 + 4 = 7/10 (Grade group 2) prostatic adenocarcinoma, present in 2 of 12 sampled cores. He was subsequently treated with cryotherapy after 6 months. He underwent a surveillance biopsy 36 months later, which also included targeted sampling of both seminal vesicles. His past medical history was remarkable for colonic adenocarcinoma of the sigmoid, treated by segmental resection and a regimen of Folfox chemotherapy. The patient was morbidly obese, with associated hypertension and hyperlipidemia, and he was on irbesartan, chlorthalidone and rosuvastatin. He also had no known bowel malabsorption abnormalities or a documented vitamin deficiency. One of the targeted seminal vesicle biopsy cores showed cells containing golden-brown granular pigment within the stromal cells surrounding the seminal vesicle epithelium (Fig. 2A–B). The pigment was essentially identical to that seen in the adjacent seminal vesicle epithelium and was Giemsa, PAS, and Luxol fast blue positive (Fig. 2C–D). Negative special stains included Masson-Fontana with and without bleach, and a Perls' Prussian blue. On immunostains, the stromal cells containing pigment were focally reactive for smooth muscle actin, but were desmin, CD68, CD1a, CD117 negative. Thus, the pigmented cells likely represented either fibroblasts or myofibroblasts. Neither the pigment nor the residual prostatic carcinoma was identified in the core biopsy tissue from the prostate, which demonstrated only stromal hyalinization with areas of necrosis and dystrophic calcification, as expected after cryotherapy.

3. Discussion

Lipofuscin is considered a 'wear and tear' pigment, derived from the cellular metabolism [2]. It is a byproduct of organelle damage associated with cellular involution or degeneration [3,4]. Specifically, trapped intracellular material is degraded into amino acids, fatty acids and carbohydrates to be re-employed during cellular anabolism [5]. Those substituents which cannot be completely degraded complex with metals such as iron, copper, aluminum, zinc and calcium [6]. These remnants of auto- or hetero-phagocytosed proteins and organelles within lysosomes become the cellular burden of lipofuscin [7]. Thus,