

Transrectal Ultrasound Appearance of Granulomatous Prostatitis

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Granulomatous prostatitis is an uncommon condition that can masquerade as prostatic carcinoma on both digital rectal exam and prostate ultrasound. It occurs most often after acute urinary tract infection, transurethral prostate resection, or needle biopsy. It can be seen in systemic granulomatous diseases and after intravesical bacillus Calmette-Guerin (BCG) therapy for bladder carcinoma. In some cases it is idiopathic. Six patients who underwent transrectal ultrasound of the prostate and subsequent transrectal ultrasound-guided biopsy had histologic diagnosis of granulomatous prostatitis. One patient was undergoing BCG therapy for bladder cancer. Two patients had recent urinary tract infections.

The other three patients had no known predisposing conditions. Sonographically, the glands were enlarged in five patients, with multiple large and small hypoechoic zones throughout the peripheral, transition, and central zones. The appearance was similar to that seen in diffuse prostatic carcinoma. In one patient, a solitary hypoechoic lesion in the peripheral zone, indistinguishable from carcinoma, was present. Granulomatous prostatitis should be considered in the differential diagnosis of focal and diffuse abnormality with prostatic ultrasound. **KEY WORDS:** prostate ultrasound, prostate cancer, prostatitis, prostate inflammation. (*J Ultrasound Med* 9:677, 1990)

Although the sonographic appearance of the prostate, in general, and in prostatic carcinoma, in particular, has been well described in the recent literature,¹⁻⁹ there has been no description of the appearance of granulomatous prostatitis. Granulomatous prostatitis is an uncommon entity that mimics prostatic carcinoma on rectal examination.¹⁰ It can occur after urinary tract infection, transurethral prostatectomy, needle biopsy, or intravesical bacillus Calmette-Guerin (BCG) therapy for bladder carcinoma. It occurs in systemic granulomatous diseases and also can be idiopathic.¹⁰ Most common symptoms are fever, chills, urgency, frequency, and dysuria.¹⁰ Although symptoms usually subside in a few months, gland induration, when present, results in persistent diffuse abnormality in 80%

or a single focal nodule in 20%.¹⁰ We report the sonographic appearance of biopsy-proven granulomatous prostatitis, seen in six cases.

METHODS AND MATERIALS

Among a large series of patients examined with transrectal ultrasound of the prostate, six were discovered to have granulomatous prostatitis confirmed histologically with ultrasound-guided transrectal biopsy. The ultrasound examinations were performed with high-frequency transrectal probes imaging in axial and sagittal planes. When focal or diffuse abnormalities were discovered, ultrasound-guided biopsies were performed using standard biopsy techniques, well described in the literature.¹⁷ The biopsies were all performed using an automatic biopsy device, the Biopsy Instrument (Bard Urologic, Covington, GA), utilizing prebiopsy and postbiopsy antibiotic coverage.⁷

The lesions that were visualized and biopsied consisted of discrete hypoechoic foci, indistinguishable so-

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nographically from prostate carcinoma. In patients where there were multiple abnormal areas detected sonographically, at least two separate discrete foci were biopsied. In addition, when a single focal abnormality was detected, a sonographically guided biopsy into a normal area in the contralateral lobe was also performed.

RESULTS

Six patients with suspected prostatic carcinoma, based on digital rectal exam and findings on prostate sonography, were retrospectively found to have granulomatous prostatitis. The patients ranged in age from 42 to 80 years. One of the patients, a 42-year-old man, had previous intravesical BCG therapy for bladder carcinoma. Two patients had recent urinary tract infections. Three patients had no known predisposing conditions. Five of the six patients had enlarged lobular glands with multiple hypoechoic lesions involving multiple areas of the prostate gland (Figs. 1 and 2). In one patient, a solitary hypoechoic lesion was present in the peripheral zone (Fig. 3). Biopsies of the hypoechoic zones revealed granulomatous prostatitis in all patients.

Cultures (four patients) or stains (one patient) for acid-fast bacilli were obtained in five of the six patients and were negative. No specific treatment for the granulomatous prostatitis was rendered. Four patients were asymptomatic, prior to and following the ultrasound and biopsy. Two patients had obstructive voiding symptoms, clinically attributed to prostatic hypertrophy. No complications from the biopsies were reported.

Figure 1 Transverse scan through the midportion of the gland in a 43-year-old man who was previously treated for transitional cell carcinoma with intravesical bacillus Calmette-Guerin therapy. The gland is moderately enlarged and there are multiple focal hypoechoic lesions seen throughout. There are scattered bright echoes compatible with corpora amylacea and/or calcifications. Biopsy of two of the hypoechoic lesions revealed granulomatous prostatitis.



DISCUSSION

The clinical and pathologic findings of granulomatous prostatitis are well described by Stillwell et al.¹⁰ Pathologically, granulomatous prostatitis is a granulomatous inflammatory reaction, usually noncaseating. The pathogenesis begins with prostatic duct blockage from infection or surgical trauma, causing tissue necrosis. Necrosis allows cellular debris and prostatic secretions, including corpora amylacea, to escape into the interstitial tissue, inciting an intense granulomatous reaction. Diffuse involvement is seen in 80% of cases, but in 20%, discrete foci can be found. The most common symptoms are fever, chills, and irritable bladder signs, such as dysuria, frequency, and urgency. Patients are usually 50 to 70 years in age. In our series, four patients were asymptomatic at the time of ultrasound and biopsy, and two had obstructive voiding symptoms (hesitancy, nocturia, and urgency).

In approximately 70% of cases, there is no defined etiology for granulomatous prostatitis. The most common predisposing factor is a recent urinary tract infection such as acute cystitis or acute prostatitis. In about 25% of cases, a prior biopsy or transurethral resection of the prostate will have been performed. A direct connection between these procedures and the development of granulomatous prostatitis has not been definitely proven.¹⁰ Granulomatous prostatitis can be seen in systemic granulomatous diseases such as Wegener's granulomatosis or allergic granulomatosis. Specific granulomatous infections such as tuberculosis, syphilis, and intravesical BCG therapy can lead to granulomatous prostatitis.¹¹ In our series, one patient had been treated

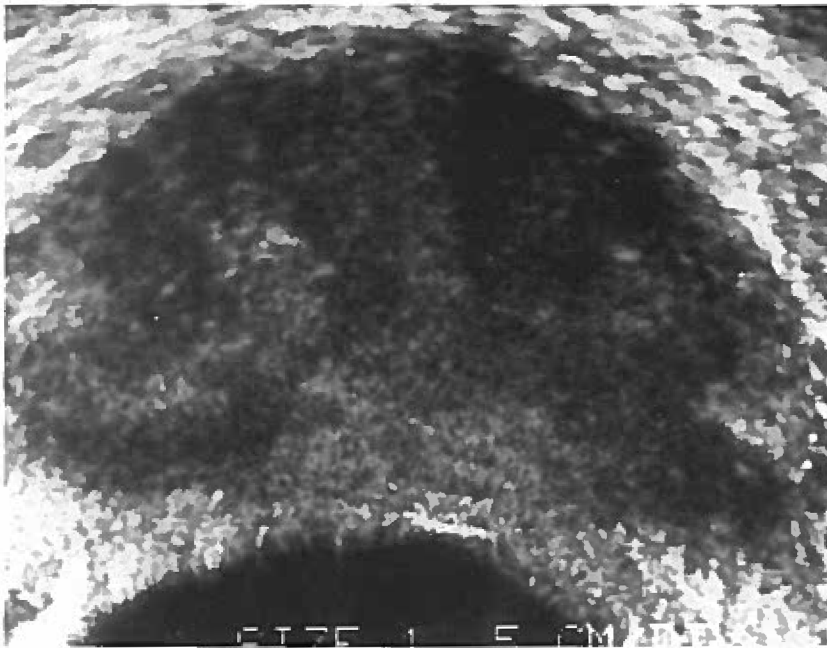


Figure 2 An 80-year-old man was examined because of a palpably abnormal prostate with diffuse induration. Transverse scan demonstrates prostatic enlargement with hypoechoic nodules throughout. Biopsy performed in both lobes revealed granulomatous prostatitis.

with BCG therapy for bladder carcinoma. Two patients had recent urinary tract infections 4 and 6 weeks prior to the discovery of granulomatous prostatitis.

Clinically, approximately 60% of patients with granulomatous prostatitis have a rectal examination that mimics prostatic carcinoma. This may be a discrete nodule or a diffusely indurated gland. In the remainder of patients, palpable findings are felt to be benign. The palpable findings are slow to resolve and may remain for years. Serum acid phosphatase elevation may occur

if gland infarction is present.¹² In our series, two patients presented with a small palpable prostatic nodule, one presented with a firm right lobe, and the remainder presented with diffusely abnormal indurated glands.

Sonographically, five of the six patients presented with enlarged glands with multiple discrete hypoechoic lesions in all three prostatic zones (peripheral, transition, and central; Figs. 1 and 2). One patient presented with a solitary hypoechoic peripheral zone lesion (Fig.

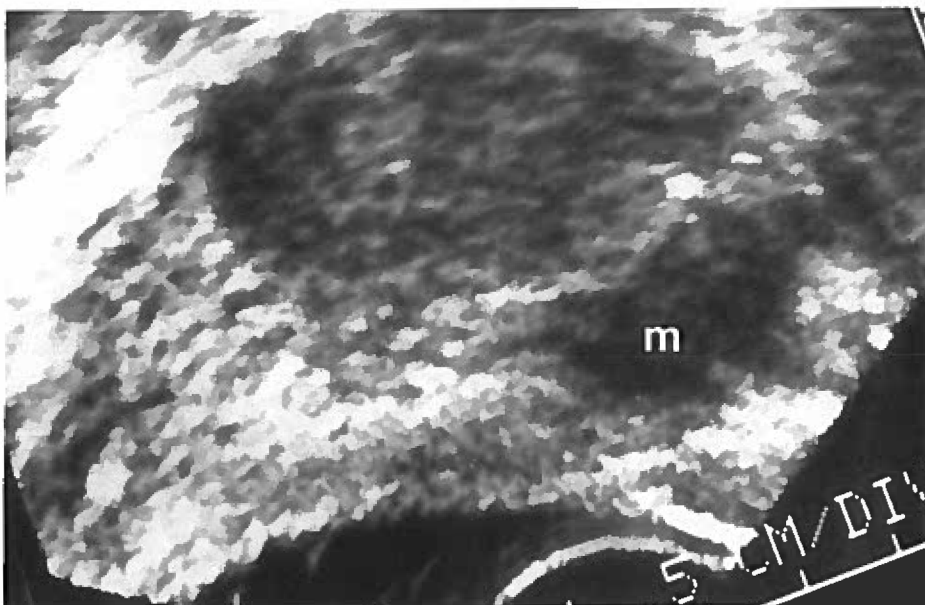
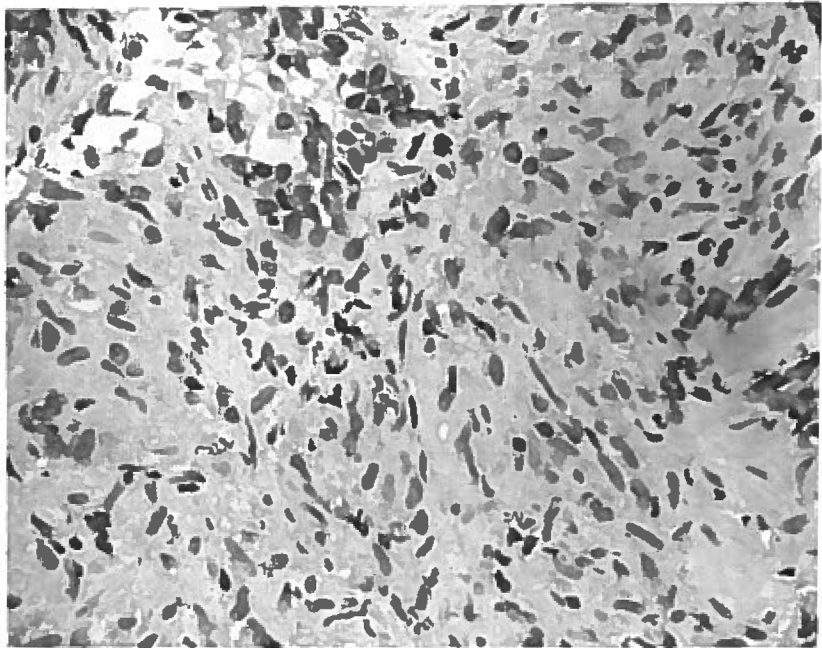


Figure 3 Sagittal transrectal sonogram of the right lobe of the prostate in a 70-year-old patient with a palpable nodule. A hypoechoic mass (m) is identified near the prostatic apex. Transrectal ultrasound-guided biopsy of this mass revealed granulomatous prostatitis. In addition, a biopsy of the opposite lobe that was not felt to be sonographically abnormal, also revealed granulomatous prostatitis.

Figure 4 Photomicrograph of representative biopsy samples showing homogeneous nature of the granulomatous disease within the prostate and explaining the hypoechoic nature of the lesions on ultrasound.



3). Both as a solitary hypoechoic nodule or as diffuse gland involvement, the sonographic appearance was indistinguishable from prostatic carcinoma. This is not surprising, given the nature of granulomatous inflammation to be relatively discrete and homogeneous histologically.^{10,12} The homogeneous nature of the granulomatous inflammatory response is demonstrated in one of the biopsy specimens (Fig. 4). Accurate differentiation can be made with ultrasound-guided biopsy, which should be the procedure of choice in these patients.

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