Xanthogranulomatous salpingitis: report of three cases and comparison with a case of pseudoxanthomatous salpingitis

E. Kostopoulou[1], A. Daponte[2], A. Kallitsaris[2], R. Papamichali[1], G. Kalodimos[1], I.E. Messinis[2], G. Koukoulis[1]

[1]Department of Pathology, [2]Department of Obstetrics and Gynecology, University Hospital of Larissa, Medical School of Thessaly, Larissa (Greece)

Summary

Xanthogranulomatous inflammation, an uncommon form of chronic inflammation, has been described in several organs including those of the female genital tract. A rare condition described as pseudoxanthomatous salpingitis or pseudoxanthomatous salpingiosis, which is often associated with endometriosis, has been distinguished from xanthogranulomatous inflammation of the fallopian tube based on its histological features. In the present report three cases of xanthogranulomatous salpingitis and one case of pseudoxanthomatous salpingitis are presented and their clinical, pathological and histochemical features are compared.

Key words: Fallopian tube; Ovary; Pseudoxanthomatous; Salpingitis; Xanthogranulomatous

Introduction

Xanthogranulomatous inflammation is characterized on microscopic examination by aggregates of lipid-laden foamy macrophages admixed with other inflammatory cells. On gross examination it presents as a golden yellow or bright yellow mass-like lesion that may mimic infiltrative cancer [1-5]. It is an uncommon form of chronic inflammation, mainly observed in the kidney and gallbladder [2, 6-8]. A few cases of xanthogranulomatous salpingitis have been described in the literature, commonly related to pelvic inflammatory disease (PID) [9-12]. Xanthogranulomatous masses of the adnexae may be highly suspicious for malignancy, both clinically and radiologically, due to the vague symptoms, and the computed tomography (CT) and magnetic resonance (MR) imaging features of the mass, which may appear invasive with irregularly enhancing portions [13]. Frozen section evaluation is important in these cases.

A rare condition variously described as pseudoxanthomatous salpingitis [10, 14, 15], pseudoxanthomatous salpingiosis [16] or pigmentosis tubae [17] has been distinguished from xanthogranulomatous salpingitis based on the presence of pigmented histiocytes in the distended plicae and the relative absence of other inflammatory cells. The lesion is most often associated with endometriosis [10, 15], while a similar lesion has been described after pelvic irradiation [17]. In some reports the two conditions are not clearly separated [18], and the possibility that they belong to a spectrum of changes has been suggested.

The purpose of the present report is to present four cases of these uncommon conditions, including three cases with a diagnosis of xanthogranulomatous salpingitis and one case of pseudoxanthomatous salpingitis, and compare their clinical, pathological and histochemical features.

Revised manuscript accepted for publication April 21, 2008

Case Reports

Case 1

A 50-year-old woman, gravida 3, para 3, presented with lower abdominal pain and fever of four days duration. One month before the patient had been hospitalized for pyelonephritis of the right kidney. She had had an intrauterine contraceptive device (IUD) for seven years. Adnexal masses were detected by gynecologic and ultrasonographic examination. The WBC was 12,900 and the reaction for C-reactive protein was positive. Serum CA125 was 54.7 U/ml and CA 15.3 was 29.6 U/ml. The preoperative diagnosis was pelvic inflammatory disease and the patient was treated for seven days with antibiotics. Subsequently, bilateral salpingo-oophorectomy and appendectomy were performed. Per-operative cultures of peritoneal fluid and purulent material from the right adnexa were negative.

A bissected 7 × 5 × 3 cm mass was received for frozen section evaluation. It involved the right adnexa, ovary and a distended fallopian tube, which showed reddish brown mucosa with bright yellow lobulated areas in the wall. The left adnexa consisted of a distended fallopian tube measuring 6 × 2.5 cm, and the ovary with a maximum dimension of 3 cm. The frozen section was negative for malignancy.

Histopathologic examination showed chronic inflammation in both fallopian tubes, extending to the right ovary. A large number of histiocytes with foamy vacuolated cytoplasm were present in the right fallopian tube. The histiocytes formed aggregates and were mixed with plasma cells, lymphocytes and neutrophils (Figure 1a). The findings in the right adnexa were consistent with a diagnosis of xanthogranulomatous inflammation. The appendix showed acute inflammation with serosal involvement.

Case 2

A 38-year-old woman, gravida 1, para 1, presented with lower abdominal pain and a low fever. An adnexal mass was detected. The patient's medical history was unremarkable. Her WBC was 9,000 and there was a positive reaction for C-reactive protein. Tumor markers were within normal limits. The clinical impression was pelvic inflammatory disease with an adnexal mass. After five days of antibiotic therapy, a right salpingoophorectomy was performed.

Fig. 1

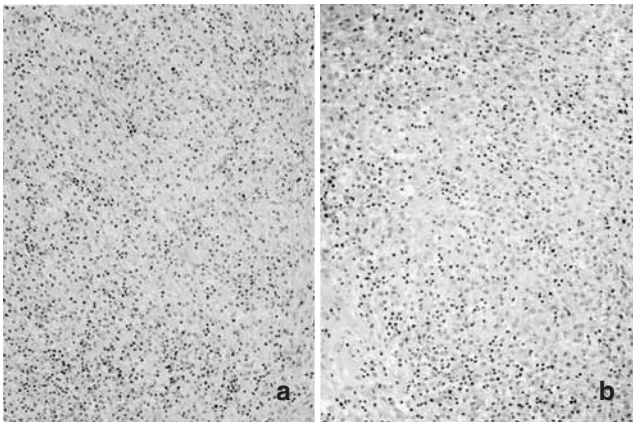

Fig. 2

Fig. 3

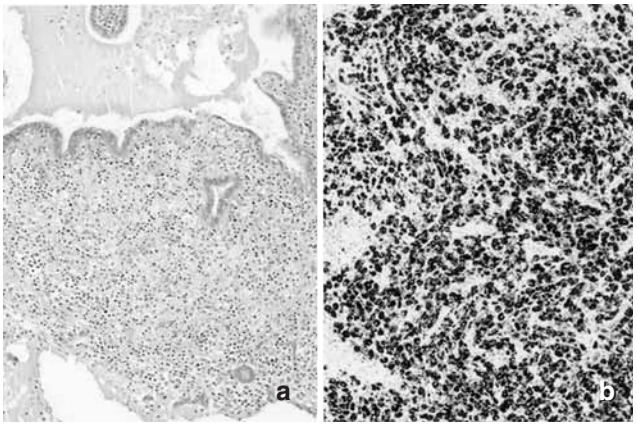

Fig. 4

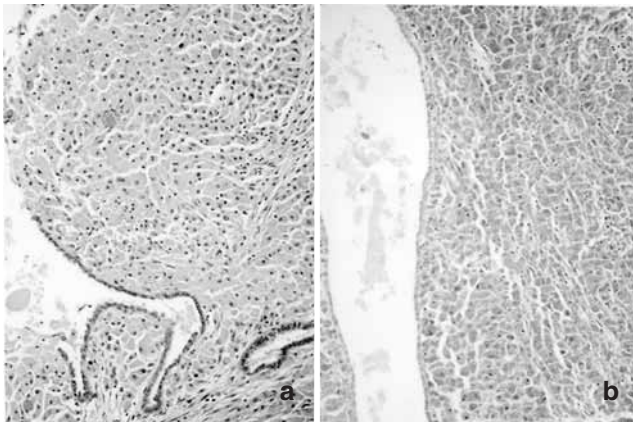

Figure 1 (a-b). Case 1. a) Foamy histiocytes admixed with variable numbers of plasma cells, lymphocytes and neutrophils in the tubal wall (H&E, original magnification x 100); b) PAS after diastase did not show strong positivity (original magnification x 100).

Figure 2. Case 2. Enlarged fallopian tube with thickened yellow mucosa.

Figure 3 (a-b). Case 3. a) Histiocytes admixed with plasma cells, lymphocytes and neutrophils, in the distended tubal plicae (H&E, original magnification x 100); b) Immunohistochemical stain for CD68 (original magnification x 100).

Figure 4 (a-b). Case 4. Numerous histiocytes causing distention of the plicae (H&E, original magnification x 100); b) PAS after diastase showed strong positive staining (original magnification x 100).

A 9 × 4 × 4 cm mass was received for histopathologic examination, including an enlarged fallopian tube, with thickened yellow mucosa showing polypoid projections and a yellow cloudy fluid (Figure 2), adherent to the ovary.

Histopathologic examination showed numerous histiocytes with foamy vacuolated cytoplasm, admixed with a large number of plasma cells, lymphocytes and neutrophils, in the distended tubal plicae. The findings were consistent with a diagnosis of xanthogranulomatous inflammation.

Case 3

A 47-year-old woman presented with lower abdominal pain. Adnexal masses were detected on gynecologic examination. Serum CA125 was 56.5 U/ml. A large solid and cystic mass was detected on CT scan. The patient underwent total abdominal hysterectomy and bilateral salpingo-oophorectomy with frozen section evaluation for suspected malignancy. A frozen section from the right adnexa performed at the time of surgery was negative for carcinoma.

On macroscopic examination, the uterus, measuring 7.5 × 5 × 4 cm, did not show any remarkable lesion. Both fallopian tubes were enlarged and edematous, measuring 8 × 3 cm and 11 × 2.5 cm, respectively, with soft consistency, yellow and brown areas and polypoid mucosal projections on cut section. The maximum dimension of the ovaries was 3 cm and 2.8 cm, respectively.

Histopathologic examination showed chronic inflammation with nodular collections of numerous histiocytes, often showing a foamy cytoplasm, admixed with a large number of other inflammatory cells in the tubal wall (Figure 3a). The findings were consistent with a diagnosis of xanthogranulomatous inflammation of the fallopian tubes, extending to the right ovary. Michaelis-Gutmann bodies were not found. The endometrium showed only focal collections of lymphocytes. An ill-defined lesion from the surface of the colon was also removed and showed xanthogranulomatous inflammation.

Case 4

A 48-year-old woman presented with abdominal pain. Transvaginal US revealed uterine leiomyomas, a dilated left fallopian tube and a left adnexal mass consisting of two cystic spaces separated by a septum. Tumor markers were within normal limits. The patient underwent explorative laparotomy. Intraoperative frozen section of the ovarian lesion showed a benign cyst con-

sistent with endometriosis, and total abdominal hysterectomy with left salpingo-oophorectomy was performed.

On macroscopic examination, the uterus measured 11 × 8 × 6 cm and showed four leiomyomas, one 4 cm in the maximum dimension, and an endocervical polyp. The ovary was enlarged, measuring 6 × 5 × 5 cm, and exhibited two cystic spaces with dark red contents. The fallopian tube was also enlarged, measuring 7 × 1.7 cm, and on cut section showed a brown-red mucosa with small polypoid projections. In the lumen there was a small amount of dark red fluid.

Histopathologic examination showed endometriosis of the ovary. The fallopian tube exhibited distention of the plicae, with numerous histiocytes within the lamina propria, that contained light brown pigment (Figure 4a). Lymphocytes and plasma cells were present in small numbers focally. The findings were consistent with a diagnosis of pseudoxanthomatous salpingitis.

Histochemical and immunohistochemical stains

Immunohistochemical stain for CD68 (PGM-1, 1:50, Dako-Cytomation, Glostrup, Denmark) (Figure 3b) was positive in the histiocytes of all cases. PAS after diastase showed weak positivity of histiocytes in cases 1 to 3 and strong positive staining in case 4 (Figure 1b and 4b, respectively). Masson-Fontana stain showed negative or focally positive staining in cases 1 to 3 and positive staining in extensive areas of case 4.

Discussion

In this study three cases with histopathologic features of xanthogranulomatous salpingitis and one case with features of pseudoxanthomatous salpingitis are presented. The microscopic and histochemical findings of the lesions and the associated disorders support the distinction of the two entities.

Xanthogranulomatous salpingitis is characterized by histiocytes with foamy vacuolated cytoplasm admixed with multiple types of inflammatory cells [10, 11], as observed in our first three cases. In contrast, pigmented histiocytes are a common finding in the stroma of well-developed endometriotic lesions and similar cells have been observed at a distance from endometriotic foci, including the mucosa of the fallopian tube [19], a condition described as pseudoxanthomatous salpingitis. These cells contain degradation products of blood, especially ceroid or lipofuscin, while hemosiderin is often less conspicuous [15]. The histiocytes in our case 4 were mostly pigmented and showed staining reactions consistent with the presence of lipofuscin or ceroid. Furthermore, the mucosal plicae in cases 1-3 often showed bridging, resulting in an altered architecture, as commonly observed in chronic salpingitis, in contrast to case 4, in which there was expansion of plicae with less prominent architectural distortion.

There was a recent history of pyelonephritis in one of our cases of xanthogranulomatous salpingitis. Only a few cases of xanthogranulomatous inflammation of the fallopian tube have been described in the literature [3, 9-12], and an association with pelvic inflammatory disease has been reported [10, 11]. In one of these [11] the presence of an IUD was reported, as in our case 1. The precise pathogenesis of xanthogranulomatous inflammation, characterized by collections of macrophages containing large amounts of lipid with tissue destruction, is not well understood. Suggested mechanisms include defective lipid transport, immunological disorders, infection by low-virulence organisms, reaction to specific infectious agents, and obstruction [6, 20]. In some cases of xanthogranulomatous inflammation microbiologic investigations have shown negative results, although in several cases bacterial cultures were positive for E. coli, Proteus vulgaris, M. gonorrhoea, and Bacterioides [9-11]. Interestingly, in a study of interval (delayed) appendectomy specimens, 36.4% of the latter were reported to show features of xanthogranulomatous inflammation compared to none in the acute appendicitis group [21].

The causes of development of pseudoxanthomatous salpingitis or salpingiosis are not clear, but the process might be due to hemorrhage directly into the fallopian tube lumen with a macrophage response [22]. Pseudoxanthomatous salpingitis was associated with endometriosis in eight of 11 cases reviewed by Furuya *et al.* [10]. In the present small series only case 4 showed evidence of endometriosis in the left ovary and this was associated with features of pseudoxanthomatous salpingitis in the ipsilateral fallopian tube.

In summary, the clinicopathologic features in this small group of patients support the distinction between xanthogranulomatous and pseudoxanthomatous salpingitis, although the presence of cases with mixed features is possible. Knowledge of these entities is important for clinicians, radiologists and pathologists, since both lesions may show features reminiscent of a malignant lesion. In these cases a suggestive preoperative diagnosis or a correct intraoperative evaluation may lead to less aggressive surgical treatment.

References

[1] Murphy W.M., Beckwith J.B., Farrow G.M.: "Tumors of the kidney". In: Tumors of the kidney, bladder, and related urinary structures. Rosai J., Sobin L. (eds.). A.F.I.P. Atlas of tumor pathology, 3rd series. Washington DC, 1994, 179.

[2] Goodman M., Curry T., Russell T.: "Xanthogranulomatous pyelonephritis (XGP). A local disease with systemic manifestations: report of 23 patients and review of literature". *Medicine*, 1979, *58,* 171.

[3] Cozzutto C., Carbone A.: "The xanthogranulomatous process. Xanthogranulomatous inflammation". *Pathol. Res. Pract.,* 1988, *183,* 395.

[4] Maeda T., Shimada M., Matsumata T. *et al.*: "Xanthogranulomatous cholecystitis masquerading as gallbladder carcinoma". *Am. J. Gastroenterol.*, 1994, *89*, 628.

[5] Oh Y.H., Seong S.S., Jang K.S., Chung Y.W., Paik C.H., Park Y.W. *et al.*: "Xanthogranulomatous inflammation presenting as a submucosal mass of the sigmoid colon". *Pathol. Int.*, 2005, *55,* 440.

[6] Antonakopoulos G.N., Chapple C.R., Newman J., Crocker J., Tudway D., O'Brien J. *et al.*: "Xanthogranulomatous pyelonephritis. A reappraisal and immunohistochemical study". *Arch. Pathol. Lab. Med.,* 1988, *112*, 275.

[7] Goodman Z., Ishak K.: "Xanthogranulomatous cholecystitis". *Am. J. Surg. Pathol.,* 1981, *5,* 653.

[8] Guzman-Valdivia G.: "Xanthogranulomatous cholecystitis in laparoscopic surgery". *J. Gastr. Surg.,* 2005, *9,* 494.

[9] Ladefoged C., Lorentzen M.: "Xanthogranulomatous inflammation of the female genital tract". *Histopathology,* 1988, *13*, 541.

[10] Furuya M., Murakami T., Sato O., Kikuchi K., Tanaka S., Shimizu M. *et al.*: "Pseudoxanthomatous and xanthogranulomatous salpingitis of the fallopian tube: a report of four cases and a literature review". *Int. J. Gynecol. Pathol.,* 2001, *21*, 56.
[11] Gray Y., Libbey N.P.: "Xanthogranulomatous salpingitis and oophoritis: A case report and review of the literature". *Arch. Pathol. Lab. Med.,* 2001, *125,* 260.
[12] Franco V., Florena A.M., Guarneri G., Gargano G.: "Xanthogranulomatous salpingitis: Case report and review of the literature". *Acta Eur. Fertil.,* 1990, *21,* 197.
[13] Kim S.H., Kim S.H., Yang D.M., Kim K.A.: "Unusual causes of tubo-ovarian abscess: CT and MR imaging findings". *RadioGraphics,* 2004, *24,* 1575.
[14] Scully R.E., Young R.H., Clement P.B.: "Other tumors and tumor-like lesions of the fallopian tube". In: Rosai J., Sobin L. (eds.). Tumors of the ovary, maldeveloped gonads, fallopian tube, and broad ligament. A.F.I.P. Atlas of Tumor Pathology, 3rd series. Washington DC, 1998, 492.
[15] Clement P.B., Young R.H., Scully R.E.: "Necrotic pseudoxanthomatous nodules of ovary and peritoneum in endometriosis". *Am J. Surg. Pathol.,* 1988, *12,* 390.
[16] Seidman J.D., Oberer S., Bitterman P., Aisner S.C.: "Pathogenesis of pseudoxanthomatous salpingiosis". *Mod. Pathol.,* 1993, *6,* 53.
[17] Herrera G.A., Reimann B.E., Greenberg H.L., Miles P.A.: "Pigmentosis tubae, a new entity". *Obstet. Gynecol.,* 1983, *61* (suppl.), 80S.
[18] Idrees M., Zakashansky K., Kalir T.: "Xanthogranulomatous salpingitis associated with fallopian tube mucosal endometriosis: a clue to the pathogenesis". *Ann. Diagn. Pathol.,* 2007, *11,* 117.
[19] Clement P.B.: "The pathology of endometriosis". *Adv. Anat. Pathol.,* 2007, *14,* 241.
[20] Russack V., Lammers R.J.: "Xanthogranulomatous endometritis: report of six cases and a proposed mechanism of development". *Arch. Pathol. Lab. Med.,* 1990, *114*, 929.
[21] Guo G., Greenson J.: "Histopathology of interval (delayed) appendectomy specimens". *Am. J. Surg. Pathol.,* 2003, *27*, 1147.
[22] Chang P., Crum C.P.: "The fallopian tube and broad ligament". In: Crum C.P., Lee K.R. (eds.). Diagnostic Gynecologic and Obstetric Pathology, Elsevier, 2006, 683.

Address reprint requests to:
E. KOSTOPOULOU, M.D.
Department Pathology,
Medical School of Thessalia,
Kalambakas 45,
Larissa (Greece)
e-mail: ekosto@med.uth.gr