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Original Research Article

Clinicopathological Study of Xanthogranulomatous Inflammation

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Abstract

Objective: To study the clinicopathological features of xanthogranulomatous inflammation in various organs. ***Materials and methods:*** A retrospective 5 years clinico-pathological study of all xanthogranulomatous inflammatory lesions observed at our Institution from 2014 to 2018 was carried out. The clinical parameters and histopathological features were documented with review of literature. ***Results:*** Total number of xanthogranulomatous inflammatory lesions encountered in this study were 31 with maximum incidence among 41-50 years age group and Female: Male ratio of 2.1:1. Around 38.7% of cases occurred in the female genital tract. Associated findings include suppuration, necrosis & hemorrhage, actinomycosis, maduramycosis, suture material, endometriosis, calculi and filariasis in this study. ***Conclusion:*** Xanthogranulomatous inflammation that mimics malignancy clinically is being increasingly encountered in various organs thereby warranting careful histopathological examination for guiding proper treatment.
Keywords: Xantho-granulomatous inflammation; Histopathology; Clinicopathological study.

INTRODUCTION

Xanthogranulomatous Inflammation is an uncommon form of chronic inflammation characterised by extensive tissue destruction and tumor like mass in the affected organ. The characteristic microscopic features of Xanthogranulomatous inflammation are presence of sheets of lipid-laden foamy histiocytes (xanthoma cells), lymphocytes, plasma cells, neutrophils and multinucleated giant cells [1]. This unique type of chronic inflammation occurs in multiple organs like kidney, gall bladder, female genital tract, male genital tract, stomach, appendix etc [2-4]. The pathogenesis of xanthogranulomatous inflammation is attributed to several causes such as persistent chronic infection, suppuration, necrosis, hemorrhage, obstruction, ineffective antibiotic therapy, abnormalities in lipid metabolism, ineffective phagocytic clearance of bacteria, calculi and retained foreign bodies like suture material [5]. This condition can be clinically mistaken for malignancy owing to its tendency to present like tumor-like mass and cause extensive adhesions to adjacent organs [6]. This retrospective 5 years (2014-2018) study is intended to analyse the clinicopathological features of xanthogranulomatous inflammation from the medical records of the department of pathology in a tertiary care hospital. The results are presented below with a review of literature.

MATERIALS AND METHODS

We undertook a retrospective clinico-pathological study of all xanthogranulomatous inflammatory lesions observed at our institution from 2014 to 2018. The clinical parameters were documented. The corresponding Haematoxylin and Eosin stained histological slides were reviewed and various associated features were documented. The results were analyzed.

RESULTS

- Total number of xanthogranulomatous inflammatory lesions encountered in this study were 31.
- Xanthogranulomatous inflammatory lesions were observed in a wide range of age group in this study with maximum incidence among 41-50 years age group (Chart-1).

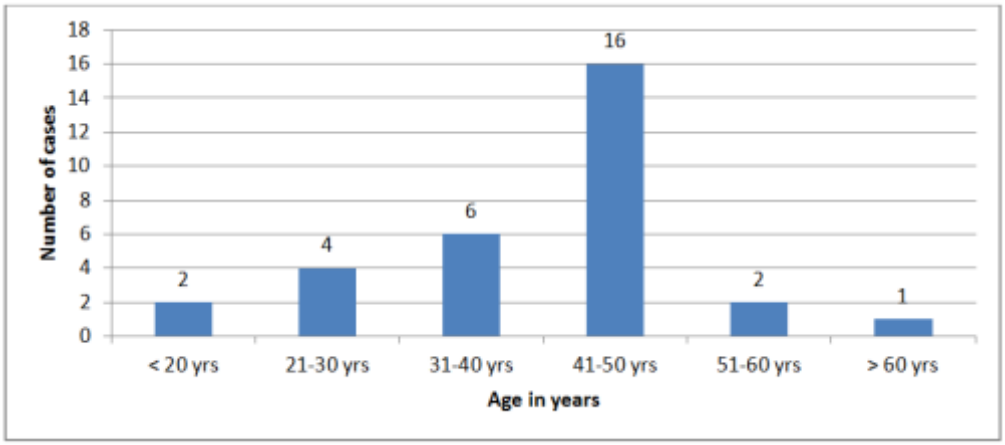

Chart-1: Age Distribution

There was female predominance in the incidence of Xanthogranulomatous inflammatory lesions in our study with Female: Male ratio of 2.1: 1 (Chart-2).

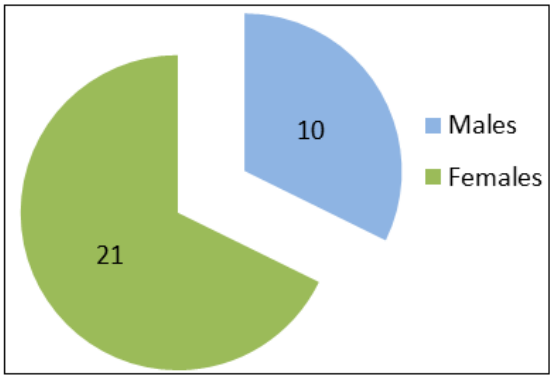

Chart-2: Sex Distribution

The site distribution of xanthogranulomatous inflammatory lesions in our study was diverse with female genital tract (Endometrium, Ovaries & Fallopian tubes) accounting for 38.7% of cases while gall bladder constituting 19.5% of cases (Table-1).

Table-1: Site distribution

S.No	Site	Number of cases	Percentage
1	Gall bladder	6	19.5
2	Endometrium	4	12.9
3	Fallopian tubes	4	12.9
4	Ovaries	4	12.9
5	Appendix	3	9.8
6	Kidney	2	6.4
7	Oral cavity	2	6.4
8	Soft tissue	2	6.4
9	Bursa	2	6.4
10	Testis	2	6.4
Total		31	100%

Table-2: Age and Sex distribution of cases in various sites

Age (yrs)	Gall bladder		Endometrium	Fallopian tubes	Ovary	Appendix		Kidney		Oral cavity		Soft tissue		Bursa		Testis	Total
	M	F	F	F	F	M	F	M	F	M	F	M	F	M	F	M	
<20						2											2
21-30							1				1		2				4
31-40		2		1	2						1						6
41-50	2	2	3	2	2			2						1		2	16
51-60			1	1													2
>60														1			1
Total	2	4	4	4	4	2	1	2	0	0	2	0	2	2	0	2	31

- Xanthogranulomatous inflammation was commonly encountered in the female genital tract (Endomterium, Ovaries and Fallopian tubes) in the age group of 41-50 years in this study with no cases reported less than 30years (Table-2).
- Both the cases of testicular and renal xanthogranulomatous inflammation occurred in 41-50 years old males (Table-2).
- All three cases of xanthogranulomatous inflammation of appendix occurred less than 30years of age (Table-2).
- Xanthogranulomatous Cholecystitis was commonly encountered in females in the age group of 31-50 years (Table-2).

Majority of cases (13 cases) of xanthogranulomatous inflammation were associated with non-specific suppurative inflammation, necrosis and hemorrhage that constituted 41.9% of total cases while calculi was seen in 8 cases (6 Xanthogranulomatous cholecystitis and 2 xanthogranulomatous pyelonephritis) that accounted for 25.8% of total cases (Table-3).

Other associated findings in our study were Actinomycosis (6.4%); Maduramycosis (6.4%); Endometriosis (9.8%); Filariasis (3.3%); Suture material (6.4%) (Table-3).

Table-3: Associated Findings in Xanthogranulomatous inflammation

S. No	Associated Findings	Number of cases	Percentage	Sites
1	Non-specific suppurative inflammation, Hemorrhage & Necrosis	13	41.9%	Ovary (3)
				Oral cavity (2)
				Appendix (3)
				Endometrium (2)
				Bursa (2)
				Testis (1)
2	Calculi	8	25.8%	Gall bladder (6)
				Kidney (2)
3	Endometriosis	3	9.8%	Fallopian tube (2)
				Ovary (1)
4	Maduramycosis	2	6.4%	Soft tissue (2)
5	Actinomycosis	2	6.4%	Endometrium (2)
6	Suture material	2	6.4%	Fallopian tube (2)
7	Filaria	1	3.3%	Testis (1)

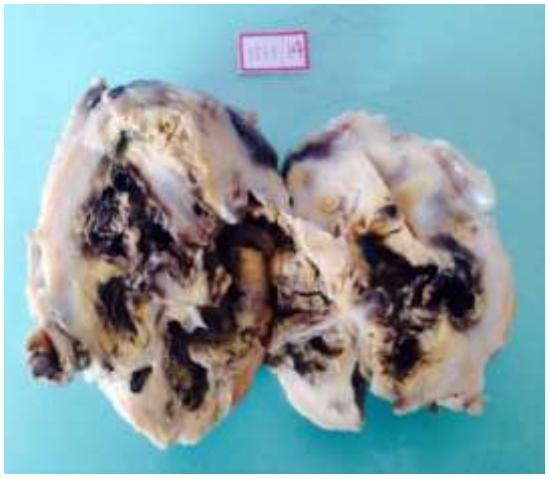

Fig-1: Ovarian Endometriosis with xanthogranulomatous change

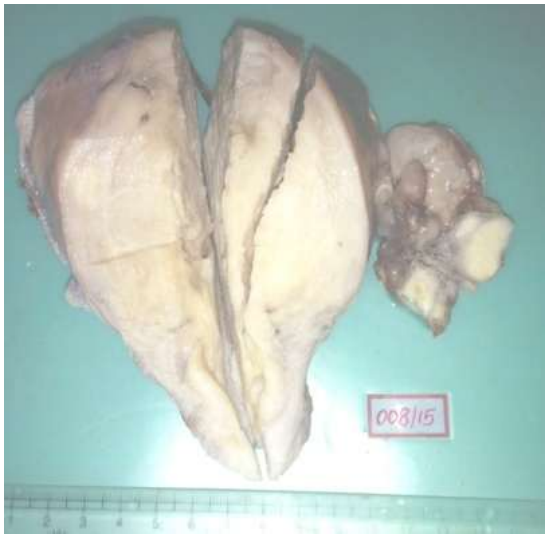

Fig-2: Xanthogranulomatous salpingitis associated with suture material

Fig-3: Xanthogranulomatous pyelonephritis associated with calculi

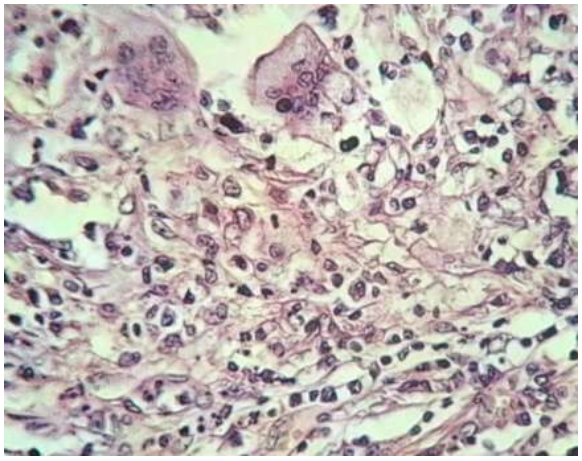

Fig-4: Xanthogranulomatous endometritis

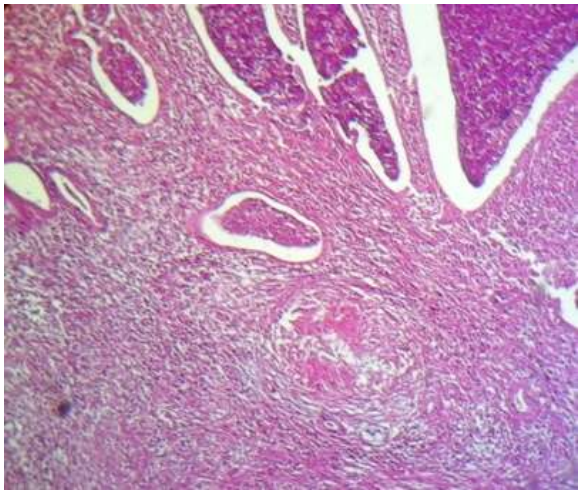

Fig-5: Xanthogranulomatous salpingitis associated with suture material

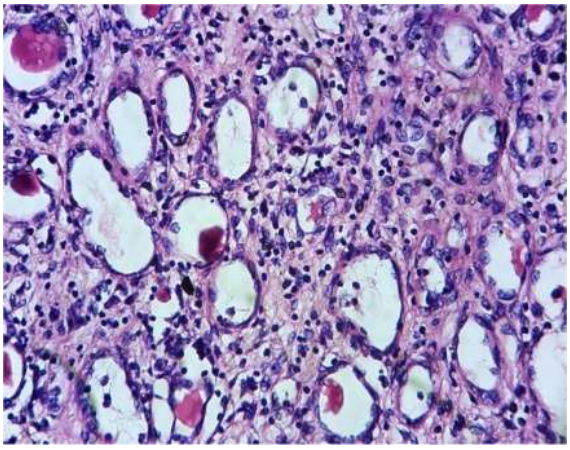

Fig-6: Xanthogranulomatous pyelonephritis

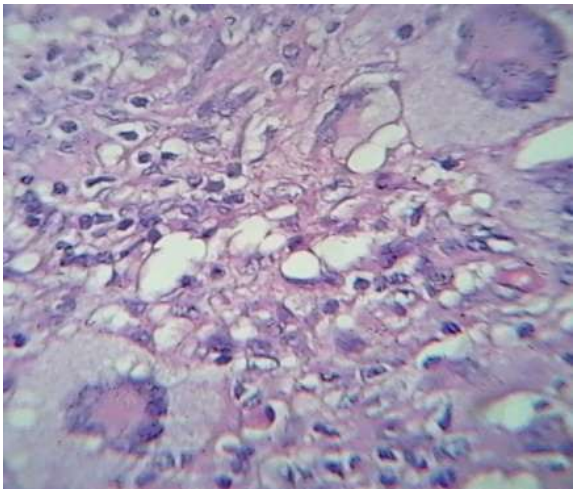

Fig-7: Touton giant cells – Xanthogranulomatous Bursitis

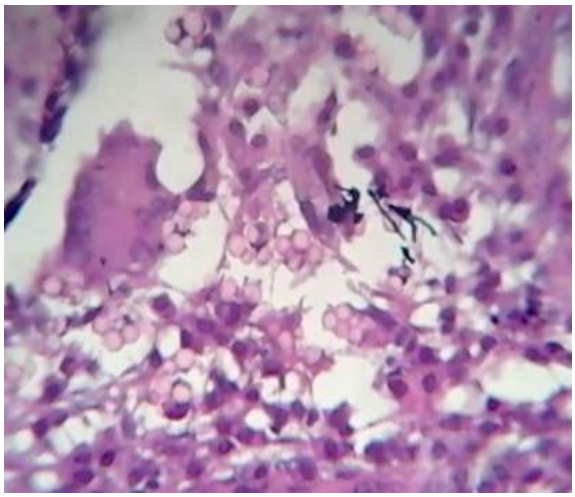

Fig-8: Russell bodies - Xanthogranulomatous Bursitis

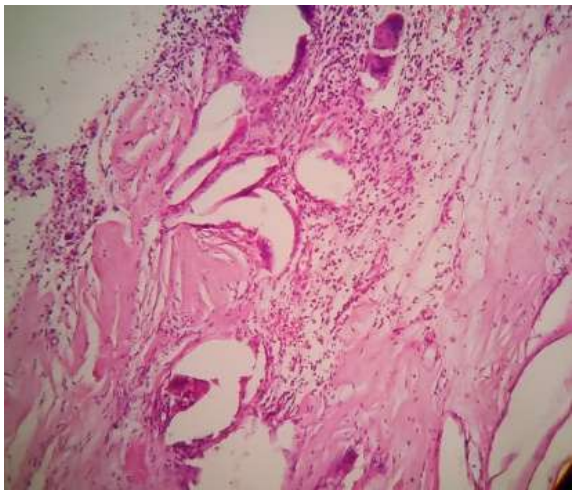

Fig-9: Cholesterol Clefts - Xanthogranulomatous Bursitis

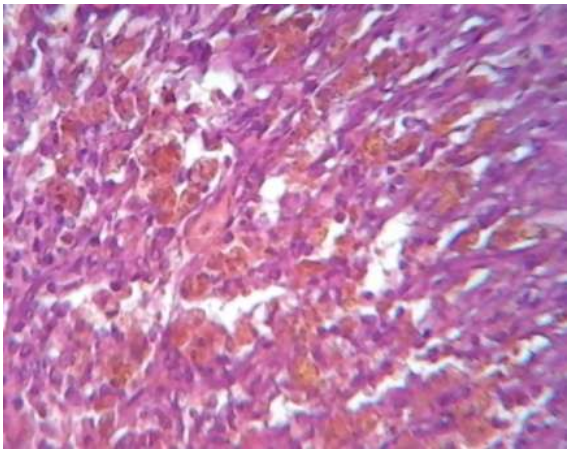

Fig-10: Hemosiderin laden macrophages - Xanthogranulomatous salpingitis

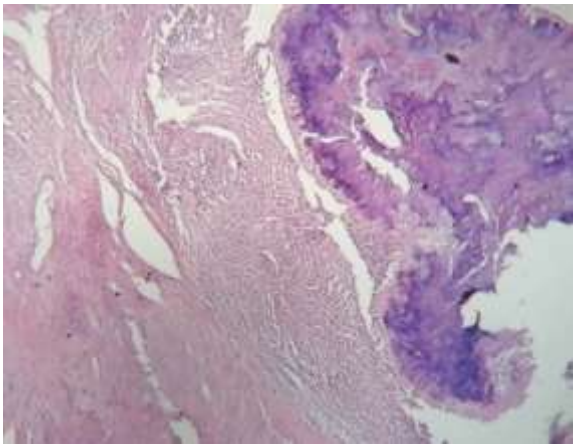

Fig-11: Xanthogranulomatous inflammation associated with Endometrial actinomycosis

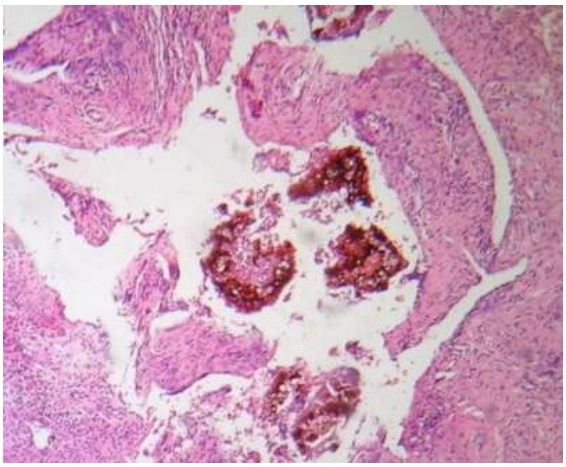

Fig-12: Xanthogranulomatous inflammation associated with Maduramycosis

DISCUSSION

Xanthogranulomatous inflammation is a unique form of chronic inflammation initiated by suppuration, necrosis and hemorrhage. Reactive foamy histiocytes, foreign body giant cells, plasma cell infiltrate and fibrosis becomes prominent in later stages simulating the picture of plasma cell granuloma or fibrohistiocytoma [5]. There is no single specific etiology for this form of inflammation though majority of xanthogranulomatous pyelonephritis are associated with E.coli and Proteus infections. Clinically this form of inflammation presents with tumor-like mass and extensive adhesions to adjacent organs thereby mimicking a malignant neoplastic process [6].

Grossly, the involved organ appears enlarged with nodular masses that show distinct yellowish and hemorrhagic grey brown areas with areas of necrosis. Microscopically, the involved organ is replaced by sheets of foamy histiocytes, mixed inflammatory

infiltrate of neutrophils, plasma cells and lymphocytes admixed with foreign body giant cells [6]. Other associated microscopic features that can be seen in xanthogranulomatous inflammatory process are hemorrhage, hemosiderin laden macrophages, cholesterol clefts, touton giant cells and russell bodies [7].

A wide range of non-neoplastic and neoplastic conditions may be associated with xanthogranulomatous inflammatory response. The common non-neoplastic conditions include chronic bacterial infections, calculi, endometriosis, suture material/foreign bodies, actinomycosis, maduramycosis, filariasis etc. Xanthogranulomatous inflammation is also associated with malignancies like adenocarcinoma of gall bladder [1].

Xanthogranulomatous inflammation is commonly reported in kidney and gall bladder [1] unlike our study where it was commonly encountered in female genital tract. This could be because of the more number of hysterectomy specimens received in our hospital. The most common age group in this study was 41-50 years and female to male ratio was 2.1:1 which is similar to the study of Laishram S *et al.*, [1].

Xanthogranulomatous inflammation of the female genital tract is uncommon. Kunakemakorn first described xanthogranulomatous inflammation of female genital tract in the year 1976 [8]. The average age of presentation is 38.5 years and ranges between 23 to72 years which is similar to the present study. Common associations were mycoplasma infections, actinomycosis, endometriosis, tubo-ovarian abscess etc [6] similar to the present study.

All cases (100%) of Xanthogranulomatous cholecystitis were associated with calculi in the present study unlike the study of Laishram S *et al*., where 86.4% cases were associated with calculi [1]. Xanthogranulomatous cholecystitis was commonly encountered in females in the age group of 31-50 years in this study similar to the study of Laishram S *et al*., [1].

Nawaz H *et al*., reported 100% association of xanthogranulomatous pyelonephritis with calculi in concordance with the present study [9].

Xanthogranulomatous inflammation of bursa (6.4%), testis (6.4%), oral cavity (6.4%), soft tissue (6.4%) and appendix (9.8%) together accounted for 35.4% of total cases in our present study unlike the study of Laishram S *et al*., [1] where the incidence of xanthogranulomatous appendicitis was only 1.1% with no cases being reported in bursa, testis, soft tissue and oral cavity. This indicates the rarity of xanthogranulomatous inflammation in these sites.

CONCLUSION

Xanthogranulomatous inflammation is a rare form of chronic destructive inflammatory condition occurring in various organs and it closely resembles malignancy clinically. It may pose a serious diagnostic challenge to the pathologists since xanthogranulomatous change is observed in many non-neoplastic and neoplastic conditions. Hence thorough histopathological examination is mandatory and correct diagnosis will avoid radical aggressive treatment procedures.

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