

A CLINICO-PATHOLOGICAL REVIEW OF BENIGN CYSTIC TERATOMA OF THE OVARY

H.C. ONG
W.F. CHAN

SYNOPSIS

Benign cystic teratoma of the ovary has a varied incidence, varying from 30 to 50 per cent of all benign ovarian tumours. This tumour tends to occur in the reproductive age group (20 to 40 years), and the majority of patients are married with children. About 40 per cent of patients are symptomless. Of those with symptoms, abdominal pain and mass are the commonest. Torsion is the most frequent complication encountered, and the presence of acute pain should make one suspect this complication. The tumour is bilateral in 10 to 20 per cent of patients. This high bilateral occurrence places a responsibility on the gynaecologist to inspect the opposite ovary in all cases of unilateral dermoid cyst of the ovary at the time of laparotomy. Germ-layer derivatives are predominantly ectodermal in origin, although both mesodermal and entodermal derivatives occur frequently.

Benign cystic teratoma of the ovary is one of the more common ovarian neoplasms. It is commonly known as the "dermoid" cyst of the ovary, and is encountered frequently enough to be regarded as a distinct pathological entity.

This paper reviews the experience with 96 histologically proven cases of benign cystic teratoma of the ovary seen in the Gynaecological Unit, University Hospital, Kuala Lumpur, Malaysia, from 1968 to 1975.

INCIDENCE (Table I)

Between 1968 to 1975, 96 cases of benign cystic teratoma of the ovary were seen, out of a total of 207 cases of benign ovarian tumours; an incidence of 46.4 per cent, compared to reported incidence of 29 per cent (Dougherty, 1968). The incidences of other benign ovarian tumours in the present series were mucinous cystadenoma (25.1 per cent), serous cystadenoma (19.8 per cent), fibromas (3.9 per cent), and

**Department of Obstetrics & Gynaecology,
Universiti Kebangsaan Malaysia.**

H.C. Ong, MBBS, MRCOG
Lecturer

**Department of Obstetrics and Gynaecology,
University of Malaya.**

W.F. Chan, MBBS, MRCOG, FRCS, FICS
Associate Professor

(Paper presented at the 11th Malaysia-Singapore Congress of Medicine, August, 1976, Kuala Lumpur)

TABLE I: Benign Tumours of the Ovary—Pathological Types

Pathological Type	Number of patients	%
Benign Cystic Teratoma	96	46.4
Mucinous Cystadenoma	52	25.1
Serous Cystadenoma	41	19.8
Fibroma	8	3.9
Mixed types	10	4.8
	207	

mixed tumours (4.8 per cent). The dermoid cyst of the ovary was therefore, the most common benign ovarian tumour seen at the University Hospital, Kuala Lumpur.

RACIAL DISTRIBUTION

Of the 96 patients, 74 were Chinese (77.1 per cent), 11 were Malays (11.4 per cent), and 11 were Indians (11.4 per cent). The racial distribution of gynaecological admissions into the University Hospital during the same period was in the proportion, 61.3 per cent Chinese, 13 per cent Malays and 22 per cent Indians.

AGE, MARITAL STATUS AND PARITY PATTERNS (Table II)

Age Pattern

The mean age of patients in this series was 30.8 years, compared to 32 years (Anees & Reddy, 1970), and 42.6 years (Malkasian et al, 1967) reported elsewhere. The youngest patient was 11 years, and the oldest was 56 years of age in this series.

The majority of patients were in the reproductive age group, 20 to 40 years (69.8 per cent). This observation is comparable to that in other series (Blackwell et al, 1946; Matz, 1961; Hall, 1963; Malkasian et al, 1967; Novak & Woodruff, 1967). Of the rest, 10.4 per cent were below 20 years of age, 12.5 per cent between 40 to 49 years, and 7.3 per cent were over 50 years of age.

Marital Status and Parity

The majority of patients in this series were married (75 per cent), and in the pre-menopausal group (95.8 per cent). Malkasian et al (1967) noted that 71.4 per cent of their patients were pre-menopausal and 28.6 per cent were menopausal. Only 4.2 per cent of patients in this series were menopausal. The incidence of unmarried patients (25 per cent) is comparable to other reports (Blackwell et al, 1946; Malkasian et al, 1967).

Of the married patients, 19.4 per cent were nulliparous, 54.2 per cent were para 1 to 4, and 26.4 per cent were para 5 and above. The mean parity was 3.1, and the highest parity was 12.

SYMPTOMATOLOGY (Table III)

Symptomless

In 36 patients (37.5 per cent), the tumour was symptomless. The incidence of symptomless tumours is as high as 52.8 per cent (Malkasian et al, 1967), although most reports suggest a lower frequency (Blackwell et al, 1946; Petersen et al, 1955; Matz, 1961).

Abdominal Pain and Mass

Symptoms referable to the tumour were present in

TABLE II: Benign Cystic Teratoma of the Ovary—Age, Marital Status & Parity

Age (years)	Single	Married			Total Patients	
		Para 0	Para 1—4	Para 5+	No	%
< 20	8	2	0	0	10	10.4
20—29	13	6	22	0	41	42.7
30—39	3	6	14	3	26	27.1
40—49	0	0	2	10	12	12.5
50—59	0	0	1	6	7	7.3
Total No.	24	14	39	19	96	
%	25.0	19.4	54.2	26.4		

TABLE III: Benign Cystic Teratoma of the Ovary—Symptomatology

Symptoms	Number of patients	%
No symptoms	36	37.5
Abdominal pain	47	49.0
Abdominal mass	28	29.2
Upper gastro-intestinal	16	16.7
Abdominal discomfort or distension	10	10.4
Menstrual	4	4.2
Lower gastro-intestinal	2	2.1
Urinary (frequency of micturition)	2	2.1

60 patients (62.5 per cent), the commonest being abdominal pain (49 per cent) and abdominal mass (29.2 per cent). Of the 47 patients who complained of abdominal pain, the pain was acute, occurring for less than a week before surgery in 23 patients (48.9 per cent); chronic pain of more than a week's duration prior to surgery occurred in 24 patients (51.1 per cent).

Other Symptoms

Upper gastrointestinal symptoms like nausea, vomiting, anorexia or dyspepsia were present in 16 patients (16.7 per cent). Abdominal distension or discomfort occurred in 10.4 per cent of patients, and menstrual disturbances were present in 4.2 per cent of patients.

Menstrual Changes

Matz (1961) commented that there were no significant menstrual irregularities associated with benign cystic teratoma of the ovary. Petersen et al (1955) reported a 15.1 per cent incidence of abnormal uterine bleeding possibly related to the tumour in their series. Of the 4 patients in this series with menstrual disturbances, 3 had menorrhagia, and one had inter-menstrual bleeding.

PRESENTATION

The operation was planned electively in 69 patients (71.9 per cent), with a pre-operative diagnosis of an ovarian tumour in all these patients. Emergency laparotomy was done in 21 patients (21.9 per cent) of whom, 15 patients (71.4 per cent) had torsion of the cyst. In 6 patients, the tumour

was an incidental finding at operation for other reasons.

LAPAROTOMY FINDINGS

Location of Tumours

Of the 96 cases, 43 occurred in the right ovary (44.8 per cent), and 37 (38.5 per cent) occurred in the left ovary. The tumour was bilateral in 16 cases (16.7 per cent), compared to reports of 10 to 20 per cent (Blackwell et al, 1946; Burgess and Shutter, 1954; Petersen et al, 1955; Hall, 1963; Malkasian et al, 1967; Jeffcoate, 1972).

Size of Tumour (Table IV)

'Maximal diameter' is used here to refer to the largest diameter of the dermoid cysts of the ovary measured at the time of laparotomy. The mean maximal diameter for the right ovary was 12.1 cm, and for the left ovary was 11.4 cm. The overall mean maximal diameter was 11.8 cm. The difference between the right and left ovary was statistically significant ($p < 0.001$). The smallest tumour was 2.0 cm, and the largest was 25 cm in maximal diameter.

The majority of the tumours in this series were in the size range 5 to 14 cm (65.1 per cent), as was reported elsewhere (Blackwell et al, 1946; Petersen et al, 1955; Malkasian et al, 1967). The mean size of tumours in this series was larger than those reported in other series (6 to 8.5 cm quoted in Blackwell et al, 1946; Malkasian et al, 1967).

Torsion

Torsion of the cyst occurred in 26 patients (27.1 per cent). Of these, 17 patients (65.4 per cent) presented with acute abdominal pain, 5 patients had chronic abdominal pain (19.2 per cent), and 4 patients (15.4 per cent) had no pain at all. Torsion occurred more commonly in left-sided tumours (16 out of 53—30.2 per cent) than in right-sided tumours (10 out of 59—16.9 per cent). The majority of cysts undergoing torsion were between 5 to 14 cm in maximal diameters (69.2 per cent), as was also the observation in Petersen et al's series (1955).

Torsion occurs in 3—16 per cent of benign cystic teratoma of the ovary (Blackwell et al, 1946; Petersen et al, 1955). The increased incidence of torsion on the left side in this series cannot be explained on the basis of size variation alone, as

**TABLE IV: Benign Cystic Teratoma of the Ovary—
Maximal Diameters of Tumour**

Maximal Diameter (cm)	Right Ovary		Left Ovary		Overall	
	No.	%	No.	%	No.	%
< 5	—	—	3	5.7	3	2.7
5—9	22	37.3	17	32.1	39	34.8
10—14	18	30.5	16	30.2	34	30.3
15—19	8	13.6	11	20.7	19	17.0
20—24	8	13.6	5	9.4	13	11.6
25—29	3	5.0	1	1.9	4	3.6
	59		53		112	
Mean Maximal Diameter (cm ± S D)	12.1 ± 4.9*		11.4 ± 4.9*		11.8 ± 4.9	

*t = 5.48, p < 0.001

the occurrences of tumours of size range 5—14 cm shows no marked difference between the right (67.8 per cent) and left (62.3 per cent).

Haemorrhage

Haemorrhage into the cyst was seen in 12 patients (12.5 per cent) in this series.

Ascites

This was present in 5 patients (5.2 per cent).

Rupture of Cyst

This is a rare occurrence, with a reported incidence of 0.4 to 1.5 per cent (Blackwell et al, 1946; Petersen et al, 1955; Malkasian et al, 1967). This complication occurred in 2 patients (2.1 per cent) in this series.

Infection

There were no cases of infection of the cyst in this series.

Pregnancy

The tumour was associated with pregnancy in 14 patients (14.6 per cent) in this series, compared to reported figures of 3 to 12 per cent (Petersen et al, 1955; Malkasian et al, 1967). Of the benign ovarian tumours, cystic teratomas appear to be the pathological type that is most commonly associated with pregnancy (Sinnathuray, 1971; Buttery et al, 1973; White, 1973).

**TABLE V: Benign Cystic Teratoma of the Ovary—
Germ-layer derivatives**

Germ-Layer Derivatives	Number of patients	%
skin	95	98.9
hair	93	96.9
sebaceous glands	91	94.8
bone	22	22.9
sweat glands	21	21.9
adipose tissue	19	19.8
cartilage	18	18.7
neural tissue	18	18.7
teeth	16	16.7
intestinal epithelium	14	14.6
smooth muscles	13	13.5
brain	12	12.5
respiratory epithelium	12	12.5
lymphoid tissue	8	8.3
thyroid tissue	7	7.3
peripheral nerve tissue	5	5.2
choroid plexus	3	3.1
ganglion cells	3	3.1
bone marrow	3	3.1
retina	1	1.0
transitional epithelium	1	1.0
breast tissue	1	1.0
Ectodermal	95	98.9
Mesodermal	52	54.2
Entodermal	28	29.2

HISTOPATHOLOGY (Table V)

Germ-layer derivatives were *ectodermal* in origin in 95 patients (98.9 per cent), *mesodermal* in origin in 52 patients (54.2 per cent), and *entodermal* in origin in 28 patients (29.2 per cent) in this series. This is compared to figures of 100 per cent, 93 per cent and 71 per cent respectively, reported in Blackwell et al's series (1946). There were altogether 22 individual tissue derivatives in this series.

It can be seen that *skin* with its appendages, *hair* and *sebaceous glands* occurred most frequently, their incidences being 98.9 per cent, 96.9 per cent, and 94.8 per cent respectively. The other common germ-layer derivatives were *bone* (22.9 per cent), *sweat glands* (21.9 per cent), *adipose tissue* (19.8 per cent), *cartilage* (18.7 per cent), and *neural tissue* (18.7 per cent).

The incidence of thyroid tissue in ovarian dermoid cysts varies from all 11 to 19 per cent (Blackwell et al, 1946; Matz, 1961). In this series, the incidence was 7.3 per cent.

ACKNOWLEDGEMENT

The authors thank Professor T. A. Sinnathuray for permission to publish the data presented.

REFERENCES

1. Anees A. M., and Reddy, C.R.R.N.: Teratomas—A Clinico-Statistical Study, *Ind. J. Med. Sci.*, 24: 261, 1970.
2. Blackwell, W. J., Dockerty, M. B., Masson, J. C., and Mussey, R. D.: Dermoid Cysts of the Ovary: Their Clinical and Pathological Significance, *Amer. J. Obstet. & Gynec.*, 51: 151, 1946.
3. Burgess, G. F. and Shutter, A. W.: Malignancy originating in Ovarian Dermoids, *Obstet. & Gynec.*, 4: 567, 1954.
4. Buttery, B. W., Beischer, N. A., Fortune, D. W. and MacAfee, C. A. J.: Ovarian Tumours in Pregnancy, *Med. J. Aust.*, 1: 345-349, 1973.
5. Dougherty, C. M.: *Surgical Pathology and Gynecologic Disease*, Hoeber, New York, pp 494, 1968.
6. Hall, J. E.: *Applied Gynecologic Pathology*, Appleton-Century-Crofts, New York, pp 268, 1963.
7. Jeffcoate, T. N. A.: *Principles of Gynaecology*, 3rd Ed., Butterworths, London, pp 59, pp 611, 1972.
8. Malkasian, G. D., Dockerty, M. B. and Symmonds, R. E.: Benign Cystic Teratomas, *Obstet. & Gynec.*, 29: 719, 1967.
9. Matz, M. H.: Benign Cystic Teratoma of the Ovary, *Obst. & Gynec. Survey*, 16: 591, 1961.
10. Novak, E. R. and Woodruff, J. D.: *Gynecologic and Obstetric Pathology*, 6th Ed., W. B. Saunders Co., pp 367, 1967.
11. Petersen, W.F., Prevost, E.C., Edmunds, F.T., Hundley, J. M. and Morris, F. K.: Benign Cystic Teratoma of the Ovary: A Clinicostatistical Study of 1007 Cases, *Amer. J. Obst. & Gynec.*, 70: 368, 1955.
12. Sinnathuray, T. A.: Ovarian Tumours in Pregnancy. A Clinico-pathologic Study, *Inter. Surg.*, 55: 422-429, 1971.
13. White, K. C.: Ovarian Tumours in Pregnancy, *Amer. J. Obst. & Gynec.*, 116: 544-550, 1973.