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Audit

Testicular pain as the initial presentation of testicular neoplasms

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***Objectives*: Testicular neoplasms are reported to present with testicular pain in 0.01–10% of patients. The diagnosis of tumour may, therefore, not be considered immediately with this mode of presentation, leading potentially to delays in diagnosis and poorer prognosis or scrotal exploration for suspected torsion. The objective of this study was to assess the incidence of pain as the presentation of testicular neoplasms.**

***Patients and Methods*: A retrospective case note analysis of all patients undergoing radical orchidectomy over an 11-year period in Hull, UK was performed. Data on presenting symptoms, histology and clinical stage were collected.**

Results: It was found that 23.5% of all patients analysed (27 of 115) presented with testicular pain, but that this did not appear to correlate with any particular histological sub-type of neoplasm or stage of disease. However, those presenting with germ cell tumours and testicular pain were more likely to suffer disease relapse than those presenting with painless testicular enlargement (1 6% compared to 2.6%).

***Conclusions:* Testicular neoplasms should be considered earlier in patients presenting with testicular pain, as this may be more common than previously reported.**

Key words: Testicular neoplasm– Presentation – Pain

The incidence of testicular tumours is approximately 2–3 new cases per 100,000 male population per year in the US and UK: of these, 90–95% are germ cell tumours. The highest incidence is seen in young adults aged 20–34 years, making them the commonest solid tumour in this age group. They represent the second commonest neoplasm in the age group 35–40 years.[1]

The commonest presenting symptom of testicular neoplasms is a gradual painless enlargement of the testicle. Some 30–40% of patients present with testicular swelling associated with aching or discomfort within the testicle. A further 10% present with clinical manifestations of metastases harboured at the time of diagnosis, for example, dyspnoea as a result of pulmonary or mediastinal metastases, or backache from retroperitoneal lymph node metastases.[1] However, on occasions, a testicular neoplasm can present with an acute history of pain within the testicle, which may be the result of haemorrhage or infarction within the neoplasm. There may also be a history of associated testicular swelling which may have preceded the pain by several weeks. Little published literature currently exists regarding the painful presentation of testicular neoplasms. It has been variably been reported as a presenting feature in between 0.01%[2] and 10%[3] of all testicular neoplasms.

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Because of this reportedly infrequent mode of presentation, the diagnosis can be overlooked,[4] leading to a delay in the time to referral and orchidectomy and an increase in the risk of developing metastases[5] or immediate scrotal exploration for suspected torsion. Orchidectomy is usually performed via the inguinal canal, primarily because of anecdotal reports of locoregional disease recurrence following scrotal incisions. However, data from the Royal Marsden Hospital suggest that scrotal incisions in men with stage I disease do not increase the risk of local recurrence.[6]

This study, therefore, set out to analyse more critically the presenting symptoms of testicular neoplasms referred to the urology department of the Royal Hull Hospitals NHS Trust over a defined time period. Specifically, the incidence of testicular neoplasms presenting as a painful testicle was identified. The aim of the study was to investigate the hypothesis that testicular neoplasms present more commonly with a painful testicle than previously reported. The work was being undertaken to identify the importance of considering the diagnosis of testicular cancer in the differential diagnosis of a painful testicle, with the aim of shortening the time to diagnosis and orchidectomy and potentially reducing the risk of metastasis development and enhancing long-term survival.

Patients and Methods

Data were obtained from the Information Services Department, Royal Hull Hospitals NHS Trust relating to those patients who underwent orchidectomy between 1 January 1990 and 31 December 2000. Local ethical committee approval for this study was obtained (ERMEC 604313/4). Data were searched for using the key phrases 'orchidectomy' or 'malignant neoplasm of testis'. The case notes for all patients listed were reviewed. Those in whom orchidectomy was performed for histologically benign testicular conditions were excluded. A total of 122 patients underwent 123 inguinal orchidectomies for testicular neoplasms during this period. Five sets of case notes were unobtainable and these patients were, therefore, also excluded. The final population studied was the remaining 117 patients on whom 118 inguinal orchidectomies were performed. Data as listed in Table 1 were stored on a database for analysis once collection was complete. The presenting symptom for each patient was recorded, and particular reference given to whether testicular 'pain' or 'ache' was present, in the presence or absence of testicular enlargement. The histological reports were studied closely and re-staged according to the 1997 version of the TNM classification of malignant tumours.[7]

Table 1 Information obtained on patients undergoing inguinal orchidectomy for testicular neoplasms over the study period

Patient name
Age at time of orchidectomy (years)
Presenting symptom
Symptoms duration prior to orchidectomy (days)
Histology
Stage of disease
Adjuvant therapy
Duration of follow-up
Time to disease relapse (if relevant)
Disease-related deaths

Analysis of statistical significance of the presenting symptom in relation to the histological variant of testicular neoplasm, relapse and initial stage of disease at presentation was sought using χ^2 with an appropriate number of degrees of freedom.

Results

Of the 123 inguinal orchidectomies performed over the study period, data were available for analysis on 118 of them. These data are represented in Table 2. As can be seen, non-seminomatous germ cell tumours (NSGCTs) tended to occur one decade earlier than seminomas, although a wide age range was seen for both groups. These data corroborate currently perceived age distributions for these testicular neoplasms.[1] There was an extremely wide range in the duration of symptoms prior to orchidectomy for all age groups analysed, with an overall median of 60 days (± 138

Table 2 Breakdown of the various histological variants of testicular neoplasms presenting over the study period showing the number presenting, respective ages of patient cohorts, median duration and range of symptoms, number of disease relapses and disease-specific deaths

Histology	Number	Mean age in years (range)	Median duration of symptoms in days (± SD)	Range in duration of symptoms (days)	Disease relapses	Disease-specific deaths
Seminoma	64	38.6 (18.6–65.5)	58 (± 123.6)	1–728	1	0
NSGCT	25	29.1 (16–57.3)	6.1 (± 43.1)	7–153	1	0
Mixed	15	33.8 (23.2–50.2)	36 (± 36.1)	1–122	4	0
Miscellaneous	14	51.8 (33.3–63.0)	293 (± 293)	14–1095	2	2

NSGCT, non-seminomatous germ cell tumour.

Table 3 Presenting symptom of testicular tumours according to histological sub-type

Histological subtype of neoplasm	Presenting symptom: Painless enlargement (± ache)	Presenting symptom: Pain (± enlargement)	Total
Seminoma*	46	15	61*
NSGCT	20	5	25
Mixed	10	5	15
Miscellaneous	12	2	14
Total	88	27	115

*Denotes two cases where presenting symptom was not documented and one where patient presented with metastases and no testicular symptoms. These three cases were excluded.
NSGCT, non-seminomatous germ cell tumour.

days). The miscellaneous testicular neoplasm group comprised 7 lymphomas, 3 Leydig cell tumours, 2 interstitial cell tumours, 1 intratubular papillary serous cystadenoma and 1 metastatic carcinoma of unknown primary.

The presenting symptoms were analysed for each patient according to how they were documented in the case notes. It is acknowledged that this is very subjective as to how the symptom was initially reported by the patient. Symptoms were categorised into two groups: (i) testicular enlargement which was painless or occurring with a dull ache, heaviness or discomfort; and (ii) painful testicular enlargement, occurring with or without associated testicular enlargement. Of the miscellaneous testicular neoplasm group, 12 presented with painless testicular enlargement and 2 with a painful, palpably normal testicle. All patients with primary testicular lymphoma presented with painless testicular enlargement. These data are shown in Table 3.

In total, 27 of 115 cases (23.5%) presented with testicular pain – 11 of these (40.7%) presented with testicular pain alone. In those patients who reported testicular pain in the absence of testicular enlargement, subsequent testicular ultrasound scanning confirmed the presence of a neoplasm. These data did not reach statistical significance ($P > 0.05$), implying that the presentation of testicular neoplasms with pain did not correlate with any particular histological sub-type.

Eight patients with germ cell tumours were lost to follow-up over the time period of this study. Three moved to other parts of the UK, where oncological follow-up was arranged. Five, however, failed to attend follow-up appointments and knowledge of their disease status is, therefore, unknown. It was the policy of the oncologists in this unit to follow testicular germ cell tumours for a disease-free period of 5 years before discharging them. Therefore, the maximum period of follow-up was 5 years.

The numbers of patients with germ cell tumours were stratified according to clinicopathological stage. These data are represented in Table 4. The majority of patients presented early with organ-confined disease ($pT_{1–4}N_0M_0$). Of the 87 patients with organ-confined $pT_{1–4}N_0M_0$ disease, 24 (27.6%) presented with testicular pain, whereas only 1 of 14 patients (7.1%) with at least nodal involvement at the time of initial diagnosis ($pT_{1–4}N_{1–3}M_{0–1}$) presented in such a manner. However, this did not reach statistical significance ($P > 0.05$).

There were 8 disease relapses seen overall (see Table 2). One patient with a seminoma had originally presented with a painfully enlarged testis. One patient with a NSGCT originally presented with painless testicular enlargement. Four patients had originally presented with mixed germ cell tumours – 3 had painful testes (± enlargement) and one a painlessly enlarged testis. The 2 'miscellaneous' disease relapses both represent testicular lymphomas and both patients here presented with painless testicular enlargement. These latter 2 patients subsequently died as a result of their disease.

With respect to the germ cell tumours, 4 patients out of 25 (16%) who had originally presented with testicular pain (± enlargement) subsequently developed disease relapse. Two of the 76 (2.6%) patients originally presenting with painless testicular enlargement had subsequently relapsed (see Table 5). Alternatively, 4 of the 6 patients who subsequently suffered disease relapse had initially presented with testicular pain. This value reached statistical significance ($P < 0.05$), implying that patients who present with testicular pain as a result of an

Table 4 Stage of testicular germ cell tumours at time of presentation according to TNM staging system

Germ cell tumour	Clinical stage: $pT_1N_0M_0$	$pT_{2–4}N_0M_0$	$pT_{1–4}N_1M_0$	$pT_{1–4}N_2M_0$	$pT_{1–4}N_3M_0$	$pT_{1–4}N_{1–3}M_1$	Total
Seminoma	33 (8)	21 (7)	1 (0)	3 (0)	3 (0)	–	61 (15)
NSGCT	14 (2)-4 (2)	5 (1)	1 (0)	–	1 (0)	25 (5)	
Mixed	8 (2)	7 (3)	–	–	–	–	15 (5)
Total	55 (12)	32 (12)	6 (1)	4 (0)	3 (0)	1 (0)	101 (25)

Numbers in parentheses indicate numbers in each stage presenting with testicular pain.
NSGCT, non-seminomatous germ cell tumour.

Table 5 Occurrence of disease relapse according to presenting symptomatology

Presenting symptom	Disease relapse		Total
	Yes	No	
Painful testicle (± enlargement)	4	21	25
Painless testicular (± enlargement	2	74	76
Total	6	95	101

$\chi^2 = 0.014$.

underlying neoplasm are more likely to develop disease recurrence than if they presented with painless testicular enlargement.

All 6 patients with germ cell tumours that suffered disease relapse initially had organ confined, $pT_{1-4}N_0M_0$ disease. Four of them were initially managed with active surveillance, but 2 had relapsed despite receiving adjuvant para-aortic and ipsilateral lymph node external beam radiotherapy. Of the 95 germ cell tumour patients who did not suffer disease relapse, 8 were subsequently lost to follow-up and, therefore, could not be analysed further. Of the remaining 87 patients, 74 had initial stage $pT_{1-4}N_0M_0$ disease and 13 had $pT_{1-4}N_{1-3}M_{0-1}$ disease. Their initial adjuvant management is as shown in Table 6.

Discussion and Conclusions

This study was a retrospective case note analysis of patients presenting to the urology department of the Royal Hull Hospitals NHS Trust with testicular neoplasms and who subsequently underwent radical inguinal orchidectomy between 1 January 1990 and 31 December 2000. A total of 118 orchidectomies were performed on 117 patients for testicular neoplasms and it was these patients who were subsequently analysed. The literature to date suggests that testicular neoplasms uncommonly present with testicular pain, ranging from 0.01%[2] to 10%.[3] However, our data suggest that such a mode of presentation may be commoner than previously reported, with 23.5% (27 out of 115 cases) of patients with testicular neoplasms in this study presenting initially, either to their primary care physician or accident and emergency department with testicular pain. In 11 cases, testicular pain was the only symptom and a neoplasm was identified on a subsequent ultrasound scan. In the remaining 16, pain was associated with a palpable testicular abnormality that had also been noticed by the patient. Our data are potentially open to subjective and/or objective bias, in that the data were compiled directly from the clinical records of the individual patients; symptoms were recorded directly as they were written in the case notes.

Despite this fact, however, almost one in four patients presenting with a testicular neoplasm did so with testicular pain and this must, therefore, be borne in mind more readily when assessing patients with testicular pain. Indeed, 11 out of 115 cases (9.6%) presented with testicular pain alone, with neoplasm being identified on subsequent testicular ultrasound scan. There was, however, no correlation between the presence of testicular pain as the presenting symptom with either the histological sub-type of testicular germ cell tumour or clinical stage of disease at presentation. However, pain as a presenting feature did appear to be significant with regards to future disease relapse. This cannot simply be explained by the fact that all patients who presented with testicular pain who subsequently relapsed were managed by active surveillance following orchidectomy (as all were stage I [$pT_{1-4}N_0M_0$] disease), as one in 3 of them had received adjuvant external beam radiotherapy. Also, of the 87 patients who did not show evidence of disease relapse, only 72 (82.8%) received adjuvant radiotherapy/chemotherapy, the remaining 15 (17.2%) being followed by active surveillance. The explanation for why 'painful' testicular neoplasms relapsed with greater frequency than 'painless' testicular neoplasms is unclear.

Therefore, these results suggest that testicular neoplasms present more commonly with a painful testicle that previously appreciated and this must be recognised if this diagnosis is not to be overlooked. Indeed, almost 1 in 10 neoplasms presented solely with testicular pain and this reinforces the idea that all patients presenting with unexplained testicular pain should undergo testicular ultrasound scanning. This raises an interesting argument. Increasing the availability of testicular ultrasound for unexplained testicular pain could lead to an increase in

Table 6 Adjuvant treatment given following inguinal orchidectomy according to clinicopathological stage at initial presentation

Disease stage	Adjuvant treatment				Total
	Surveillance	Chemotherapy	EBRT	Chemotherapy + EBRT	
$pT_{1-4}N_0M_0$	15	7	52	0	74
$pT_{1-4}N_{1-3}M_{0-1}$	0	10	2	1	13
Total	15	17	54	1	8

EBRT, external beam radiotherapy.

the diagnosis of testicular neoplasms presenting in this fashion. In the past, however, when testicular ultrasound was not widely available, patients with testicular pain alone and underlying neoplasms may not have been scanned. It is unlikely that a large proportion of these patients' neoplasms underwent spontaneous regression, as such regression of testicular germ cell tumours is known to be rare.[8] Therefore, increasing the availability of testicular ultrasound for unexplained testicular pain is unlikely to lead to an increase in the diagnosis of neoplasms. The issue is to be aware of the possible diagnosis earlier and to scan sooner.

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References

1. Richie JP. Neoplasms of the testis. In: Walsh PC, Retik AB, Vaughan ED, Wein AJ. (eds): *Campbell's Urology*, vol 3, 7th edn. Philadelphia: WB Saunders 1998; 2411–52.
2. Cespedes RD, Caballero RL. Cryptic presentations of germ cell tumours. *J Am Coll Surg* 1994; **178**: 261–5.
3. Presti JC, Herr HW. Genital tumors. In: Tanagho EA, McAninch JW. (eds) *Smith's General Urology*, 14th edn. Connecticut: Appleton and Lange, 1998; 434–47.
4. Arvola I, Lilius HG. Malignant testicular tumours presenting with severe acute pain. *Ann Chir Gynaecol Fenniae* 1972; **61**: 30–2.
5. Oliver RT. Factors contributing to delay in diagnosis of testicular tumours. *BMJ* 1985; **290**: 356.
6. Kennedy CL, Hendry WF, Peckham MJ. The significance of scrotal interference in stage I testicular cancer managed by orchidectomy and surveillance. *Br J Urol* 1986; **58**: 705–8.
7. Sobin LH, Wittekind C. *TNM Classification of Malignant Tumours*, 5th edn. New York: Wiley-Liss, 1997; 174–9.
8. Whitmore Jr W. The treatment of germinal tumours of the testis. In: *Proceedings the 6th National Cancer Conference*. Philadelphia: JB Lippincott, 1968; 347–55.