

The management of a neck mass: presenting feature of an asymptomatic head and neck primary malignancy?

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Summary

Malignancy of the upper aerodigestive tract is not always associated with obvious localizing symptoms. Presentation may then only be prompted by the appearance of a hard mass in the neck, a metastasis to a cervical lymph node. Neck exploration without a prior diligent search for an occult head and neck primary tumour is to be avoided as it compromises subsequent treatment.

The diagnostic investigation of 112 patients complaining solely of a painless and enlarging neck swelling is reviewed. An otolaryngologic examination identified an asymptomatic malignancy of the head and neck in 72 patients (64%). Excision biopsy of the neck mass was required to achieve a diagnosis in only 29 (29%) of those patients who had not already undergone surgery. These results are presented to emphasize the need for a specialist examination of the head and neck prior to embarking on excision of any suspicious neck mass.

Introduction

The adult patient with a mass arising in the neck frequently presents to a general surgeon rather than to an otolaryngologist. However, this mass may represent a metastasis from an asymptomatic primary tumour of the head and neck, which will only be detected on clinical examination. Inappropriate neck exploration, if it should reveal a deposit of squamous cell carcinoma, adversely affects the prognosis. Furthermore, a preliminary search for a primary squamous cell carcinoma may well reveal a resectable lesion. This contrasts with the patient presenting with a metastasis containing adenocarcinoma, whose primary tumour almost invariably arises below the clavicle and is irresectable.

To determine the value of a specialist examination of the head and neck in such cases, we have reviewed 112 patients, presenting over a ten year period, whose sole

presenting complaint was of a painless, enlarging neck mass.

Patients and methods

A total of 112 patients were referred for specialist examination to the Department of Otolaryngology, North Riding Infirmary, Middlesbrough, in a 10 year period in 1975-85. Eighty one patients were referred by their general practitioners and 31 by our surgical colleagues. All had presented with a neck mass but were otherwise asymptomatic. We have therefore excluded from this series those patients with localizing symptoms in the head and neck, such as dysphagia, hoarseness or haemorrhage.

A small number, only 14 (12.5%), had already undergone a neck exploration for a histologic diagnosis, which had proved to be metastatic squamous cell carcinoma.

A careful history was taken with special enquiry as to dysphagia, voice change, otalgia and hearing loss, a possible consequence of Eustachian tube obstruction. Clinical examination, both by direct inspection mirror view and palpation assisted by topical anaesthesia, tended to concentrate on the relatively 'silent' areas of the upper aerodigestive tract, especially the nasopharynx, oropharynx and supraglottic larynx. Lately, an Olympus fiberoptic nasendoscope was routinely employed to aid inspection. When examination revealed no abnormality, sinus and chest X-rays, a lateral soft tissue view of the neck and a submentovertical view of the base of the skull were obtained. A barium swallow was requested if there was any suggestion of dysphagia.

Patients still failing to show evidence of a primary head and neck malignancy then underwent panendoscopy: laryngoscopy and bronchoscopy, pharyngoscopy and oesophagoscopy. Random biopsies of the postnasal space from both the roof and fossae of Rosenmüller were also taken. Palpation of the oral cavity and oropharynx is more sensitive during anaesthesia when muscle tone is absent.

Only when no lesion was immediately evident, was excision biopsy of the neck mass undertaken. This was done under the same anaesthetic and using an incision which would not compromise subsequent surgery. Histology of paraffin-fixed sections was awaited rather than proceeding immediately to definitive management, such as radical neck dissection, on evidence of frozen sections.

Results

In the 10 year period 112 patients presented with a neck mass. Fourteen patients (12.5%) had already undergone neck exploration with subsequent histology revealing a squamous cell carcinoma. All were submitted to the protocol described to exclude a head and neck primary malignancy.

Initial examination at the first ENT consultation revealed a primary tumour in 72 patients (64%) of whom 11 had undergone prior neck surgery. Radiologic screening identified few tumours not already apparent but did detect three bronchial and one oesophageal carcinoma. Equally, panendoscopy found few primary malignancies in patients who were normal on clinical examination. Three further bronchial carcinomas and one postericoid carcinoma were discovered.

Ultimately of 98 neck masses unoperated prior to presentation only 29 (29%) required exploration of the neck to diagnose the cervical pathology. Twelve showed a benign lesion. Of the 17 malignancies, 10 were squamous cell carcinomas. Including the 14 cases already operated on, a total of 24 epithelial malignancies were revealed in the neck masses which were explored. In one half, 12 patients, no head and neck primary was ever to become evident on regular review. One was diagnosed as branchial sinus carcinoma and no primary was later manifest to contradict this. In one further patient, who underwent neck exploration prior to referral, a primary tumour of the posterior third of the tongue became apparent two years subsequently (Table I).

TABLE I Stage at which diagnosis made in 112 cases with a cervical mass

Stage	Findings	N
Clinical examination	Head and neck primary tumour	72
Radiology	Bronchial or oesophageal primary SCC	4
Panendoscopy	Primary SCC	4
Neck exploration	Squamous cell carcinoma (no primary)	9
	Benign pathology	12
	Non-epithelial malignancy	7
	Branchial sinus carcinoma	1
Biopsies prior to presentation	No primary apparent	3

Submission of the 112 patients presenting with a neck mass to the protocol described ultimately identified a head and neck primary in 80 (71%) patients. Over one quarter of these *occult*, asymptomatic, malignancies (22 cases) were nasopharyngeal carcinomas.

Discussion

The need for a specialist examination of the head and neck in such cases was illustrated by the pioneering work of Hayes-Martin (1). In patients referred to him with

metastatic neck cancer and an allegedly occult primary, his initial clinical examination revealed a head and neck primary tumour in 65%. This figure corresponds remarkably with the results presented above (64%). Even when such an origin is not immediately obvious, up to one quarter of patients may ultimately exhibit a primary tumour of the upper aerodigestive tract (2). As shown, years of meticulous follow-up may be necessary.

Injudicious excision of a neck mass which then proves to contain squamous cell carcinoma compromises management. Goeder and Palmer reviewed 1,090 patients with such a cervical metastasis (3). Of the 84 who had undergone incisional biopsy, 23% developed sepsis at the site of the incision compared with only 5% of patients developing sepsis in an unbiopsied neck mass. Fungation of tumour was more common following incisional (21%) rather than excisional (11%) biopsy and was rare (7%) in the absence of surgery. The survival time of their patients was not influenced by biopsy however. McGuirt and McCabe reported their experience with 74 patients undergoing radical neck dissection subsequent to node biopsy and found an increased incidence of wound necrosis, local recurrence and distant metastases (39%) (4). Furthermore, Shaw points out that subsequent scarring causes difficulty in palpation and assessment of the neck, whilst removal of the mass creates a false sense of security in the patient (2).

It is to the credit of our medical and surgical colleagues that only 12.5% of our cases had undergone prior neck exploration and that these had all undergone excisional biopsy. Perhaps as a consequence, only one of these patients developed fungation through cervical skin.

A thorough ENT examination is therefore sensible and frequently rewarding. In order of decreasing frequency, likely sites of an occult primary carcinoma presenting as a cervical metastasis are: nasopharynx, tonsil, tongue base, thyroid, supraglottic larynx, floor of mouth, palate and piriform fossae (2). Most are detectable on initial clinical examination by an otolaryngologist. In our series, examination under anaesthetic was needed to diagnose four of all the head and neck carcinomas, which had not already become apparent during investigations.

Over one quarter (22 cases) of the asymptomatic head and neck malignancies were nasopharyngeal carcinomas. Presenting features of nasopharyngeal carcinoma are noticeably non-specific and so only half are diagnosed within three months of onset of symptoms. Nasal symptoms such as obstruction or epistaxis present late in the disease and the early tumour may be submucosal and therefore not apparent on superficial examination. Deep random biopsy is the mainstay of diagnosis. Radiological evidence of skull base erosion was only found in 27 of 160 patients with nasopharyngeal carcinoma presented by Dickson (5). A promising development is the immunologic detection of the occult tumour. Neel *et al.* sought the viral capsid antigen associated with the E-B virus in patients with a carcinomatous neck mass. Raised titres were detected in 6 of 18 such patients and a postnasal space carcinoma was subsequently found. A false negative rate of only 20% was claimed (6).

A thorough examination under anaesthesia should also include excision and serial histological sectioning of the tonsils, as tumour may not be associated with mucosal ulceration (7). Bronchoscopy and oesophagoscopy are generally thought unrewarding unless there is radiologic evidence of tumour (8). We have, however, identified 4 bronchial or oesophageal carcinomas on endoscopy in the absence of X-ray abnormality. Maisel and Vermeersch (9) reviewed 449 patients with a primary head and neck carcinoma and found synchronous second primary tumours in no fewer than 36, half occurring in

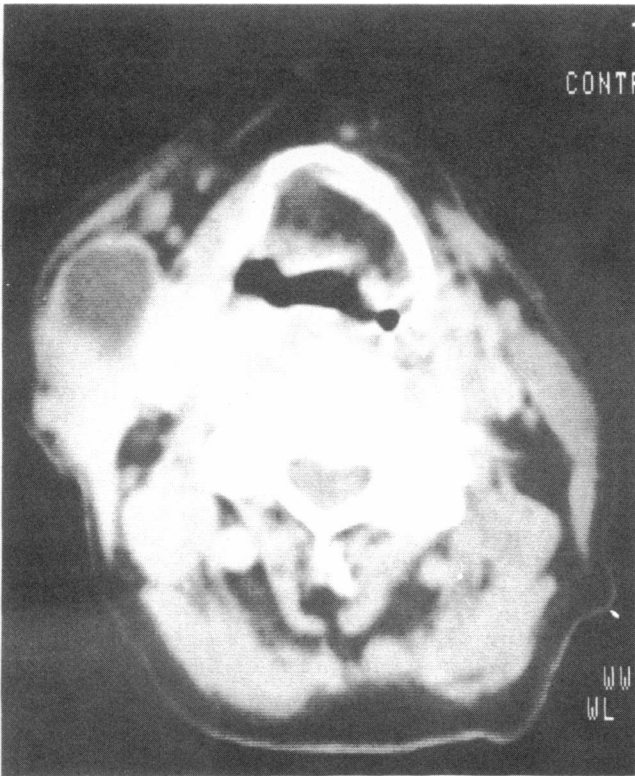


FIG. 1 CT of neck; cystic degeneration in a squamous cell carcinoma involving a lymph node and secondary to a laryngeal tumour.

the lung. Thus discovery of one primary should not curtail completion of a full examination.

The site and level of the presenting cervical metastasis may be a guide to its origin and prognosis. In 207 patients with a suspicious cervical lymphadenopathy, Johnson and Newman found a primary head and neck cancer in 45, all of whom exhibited involvement of jugulodiaphragmatic nodes (10). No ENT cancers were associated with single, isolated nodes in the supraclavicular or posterior cervical regions. The remaining 162 cases in this series underwent node biopsy to reveal lymphoma in 20% and an infraclavicular primary tumour (usually bronchial) in 18%. Submental nodes were only associated with lymphoma or benign disease, while, in contrast, low posterior cervical nodes showed a 60% incidence of malignancy (10). Thus the lower the cervical node involvement, the worse the prognosis becomes. Carcinoma in submandibular nodes carries a 34% five year survival, compared with 4% for supraclavicular nodes (11).

As shown, incisional biopsy is always to be avoided and core needle biopsy risks seeding of tumour cells (12). Fine needle aspiration cytology can, in expert hands, reliably diagnose malignant disease in lymph nodes. Young *et al.* report an accuracy of 94.5% in detecting tumour in thyroid, salivary and nodal tissue. In 280 cases of a mass in the neck, only 15 errors were encountered. Of 13 initially false negative reports, 8 proved positive on repeat aspiration. In only two false positive results did aspiration falsely suggest malignancy in nodes subsequently shown to be inflammatory. Unfortunately only 75% reliability was reported for lymphomas (13). Aspiration may reveal a cystic lesion but a malignancy with necrotic centre may resemble a branchial cyst and should not be confused (7). A branchiogenic carcinoma is very rare and should only be diagnosed after satisfying rigid criteria (14) (Fig. 1).

In a minority of patients, 29% in our series, an excisional biopsy of a cervical mass will become necessary to make a diagnosis. Frozen section has been reported to allow diagnosis of the cell type in all but 1.2% of cases. False negative reports usually result from a diagnosis of hyperplasia, when subsequent paraffin section shows lymphoma (15). The pathologist can provide much more information if suitable tissue is provided for electron microscopy and analysis of tumour cell surface markers, especially when confronted with a seemingly undifferentiated lesion which may be of epithelial or reticulo-endothelial origin (16). Ideally, fresh tissue is immediately forwarded to the laboratory. Fixation in glutaraldehyde is recommended for electron microscopy (17).

Leipzig *et al.* (18) recommended that nodes smaller than 3 cm in diameter are irradiated. Fields should include presumed primary sites from the nasopharynx to piriform fossa. More advanced nodal disease is treated by radical neck dissection producing an overall five year survival of 50% (8). Whether a primary tumour subsequently manifests itself does not alter prognosis (18). Adenocarcinomatous metastases to the neck, especially common in renal tumour (14), are best treated palliatively. There are very few two year survivals (8).

We have not been able to study the effect on prognosis of neck exploration prior to diagnosis of a primary head and neck malignancy as we lack an adequate control group. This is a tribute to the clinical judgement of our medical and surgical colleagues and we gratefully acknowledge our debt.

Although current advances in diagnosis, such as CT and radio-isotope studies, may yet contribute to management, a specialist clinical examination of the head and neck is of considerable value prior to exploration of a suspicious neck mass.

References

- 1 Martin H, Romeiu C. The diagnostic significance of a lump in the neck. *Postgrad Med J* 1952;11:491-501.
- 2 Shaw HJ. Metastatic carcinoma in cervical lymph nodes with occult primary tumour—diagnosis and treatment. *J Laryngol Otol* 1970;84:249-156.
- 3 Goeder P, Palmer M. Cervical lymph node biopsy—a study of its morbidity. *J Laryngol Otol* 1984;98:1031-40.
- 4 McGuiert WF, McCabe BF. Significance of node biopsy before definitive treatment of cervical metastatic carcinoma. *Laryngoscope* 1978;88:594-7.
- 5 Dickson RI. Nasopharyngeal carcinoma: an evaluation of 209 patients. *Laryngoscope* 1981;91:333-54.
- 6 Neel HB, Pearson GR, Weiland LH. Immunological detection of occult primary cancer of the head and neck. *Otolaryngol Head Neck Surg* 1981;89:230-4.
- 7 Marlow FI, Goodman RS, Mobini J, Dave V. Cystic metastasis from occult tonsillar primary simulating branchiogenic carcinoma. *Laryngoscope* 1984;94:833-5.
- 8 Spiro RH, De Rose G, Strong EW. Cervical node metastasis of occult origin. *Am J Surg* 1983;146:441-6.
- 9 Maisel RH, Vermeersch H. Panendoscopy for second primaries in head and neck cancer. *Ann Otol Rhinol Laryngol* 1981;90:460-4.
- 10 Johnson JT, Newman RK. The anatomic location of neck metastases from occult squamous cell carcinoma. *Otolaryngol Head Neck Surg* 1981;89:54-8.
- 11 Stell PM, Morton RP, Singh SD. Cervical lymph node metastasis: the significance of the level of the lymph node. *Clin Oncol* 1983;9:101-7.
- 12 Simpson GT. The evaluation and management of neck masses of unknown aetiology. *Otolaryngol Clin North Am* 1980;13:489-98.
- 13 Young JE, Archibald SD, Shier K. Needle aspiration cytologic biopsy in head and neck masses. *Am J Surg* 1981;142:484-9.
- 14 Batsakis JG. The occult primary. *Head Neck Surg* 1981;3:409-23.

- 15 Remsen KA, Lucente FE, Biller HG. Reliability of frozen section diagnosis in head and neck neoplasms. *Laryngoscope* 1984;94:519-24.
- 16 Miller D, Ervin T, Weichselbaum R, Fabian R. The differential diagnosis of the mass in the neck: a fresh look. *Laryngoscope* 1981;91:140-5.

- 17 Ramsay A, Flood LM, Fisher C. The role of electron microscopy in diagnosis of tumours of the head and neck. *J Clin Pathol* (In Press).
- 18 Leipzig B, Winter ML, Hokanson JA. Cervical nodal metastasis of unknown origin. *Laryngoscope* 1981;91:593-7.

Notes on books

A Colour Atlas of Open Reduction of Congenital Dislocation of the Hip by A Catterall. 63 pages, illustrated. Wolfe Medical, London. £14.

Volume 35 in the Single Surgical Procedures series. Sixty-seven high quality colour photographs illustrate this operation and the volume will appeal to all surgeons who have to manage late presentation of congenital dislocation of the hip.

Stroke Rehabilitation edited by Paul Kaplan and Leonard J Cerrullo. 421 pages, illustrated. Butterworths, Boston. £45.

For many years the two editors ran a course at the Rehabilitation Institute of Chicago called Stroke and Neurosurgical Rehabilitation. These courses were exceedingly popular with much discussion and became the starting point for many investigations. This book is the distillation of one such course and will no doubt be read with enthusiasm by all those concerned in the management of patients who have had a stroke. There are 18 chapters and 24 contributing authors.

Surgery of the Spleen by Rainer M Scufert and Paris S Mitrou translated and edited by Howard A Reber. 167 pages, illustrated. Georg Thieme Verlag, New York. DM 88.

Splenic surgery now comprises more than merely surgical excision. Indeed, preservation of the spleen after splenic trauma is highly desirable and various repair operations have been devised. Segmental resection of the spleen can be performed and auto-transplantation has been studied in several centres. This monograph succinctly tells of splenic physiology and disease as they relate to surgical patients in less than 200 pages and includes an extensive bibliography making it a valuable reference volume. It has few if any competitors and should be of wide interest.

Ophthalmic Plastic and Reconstructive Surgery by Martin Hatt. 166 pages, illustrated. Georg Thieme Verlag, Stuttgart. DM 128.

This book deals mainly with surgery of the eyelids and the lachrymal system: operations on the eye itself are excluded. The book is attractively produced, nicely illustrated and well referenced.

Renal and Urologic Emergencies edited by Allan B Wolfson and Ann Harwood-Nuss. 291 pages, illustrated. Churchill-Livingstone, New York. £28.

A relatively short and readable account of the various emergencies that may present to the urologist or nephrologist. There are thirteen chapters, each well referenced and adequately illustrated. The Accident and Emergency surgeon may find the book of particular interest as it is written with the emergency setting in mind.

Pathology for the Primary FRCS by D L Gardner and D E F Tweedle. 216 pages, paperback. Edward Arnold, London. £11.95.

A revision text for the Primary FRCS in Pathology. It is written in the style of a concise encyclopaedia with brief accounts of individual subjects being given in alphabetical order. Thus, page 1 has paragraphs on Abrasion, Abscess, Acidaemia and Alkalaemia while the last page has an article on Wound Infection. Hardly any subject is given more than a page and many only a few lines. There are no references but brief biographical details of eponyms are given as footnotes.

Practical Procedures in Accident and Emergency Medicine by David G Ferguson and Stuart M Lord. 237 pages, illustrated, paperback. Butterworths, Sevenoaks. £12.50

A book written primarily for medical students and housemen. Nearly one hundred practical procedures are clearly described in words and illustration. Each procedure is confined to two pages—on the left hand side is given a short text and on the right hand side a clear line diagram. The various sections cover vascular access, airway procedures, cardiac and abdominal procedures, local anaesthetic techniques as well as minor surgical operations and the application of plaster of Paris.

Complications in Otolaryngology—Head and Neck Surgery Volume 1 Ear and Skull Base edited by R J Wiet and J-B Causse. 207 pages, illustrated. B C Decker, Philadelphia. £40.

Complications after surgical operations are a fact of life although it is well known that some surgeons have fewer complications than others. This book addresses those complications specific to operations on the ear and skull base with a view to reducing the incidence by prevention. The majority of the contributors are from North America although a few are from Europe. The book is handsomely published in large format on art paper with high quality illustrations including several in colour. Twenty five chapters, each with key references.

Cancer Pain Relief. 74 pages, paperback. World Health Organization, Geneva. \$7.80.

Cancer is a major world problem. Every year nearly six million new patients are diagnosed and many of those with advanced disease have pain as a major symptom. Historically the control of pain in terminal illness has been poorly managed but techniques now exist to make pain relief a realistic objective for the vast majority of cancer patients around the world. This small book tells how. Produced by the World Health Organization in a concise, didactic and logical layout it is suitable not only for doctors but also for nurses and others who care for patients with advanced malignancy. Hospital managers too might find much of interest.

Preoperative (Neoadjuvant) Chemotherapy edited by J Ragaz, P R Band and J H Goldic. 162 pages, illustrated. Springer-Verlag, Berlin. DM 98.

A comprehensive and up-to-date review of preoperative adjuvant chemotherapy reporting the Proceedings of a Symposium held in Vancouver in March 1985. The early chapters discuss the scientific basis and experimental data but later chapters report the results of preoperative chemotherapy trials in breast, lung, gastrointestinal and head and neck cancers as well as in sarcomas.

Epidemiology of Malignant Melanoma edited by R P Gallagher. 169 pages. Springer-Verlag, Berlin. DM 98.

The incidence of malignant melanoma is increasing rapidly and it is therefore timely that a book should appear which concentrates on the epidemiology of this tumour. Treatment of the disease has not improved dramatically and the best hope for stemming the rise in mortality is through early detection and perhaps in the future through prevention. It is thus important to recognise groups at high risk. This book gives a thorough assessment of the major risk factors.