

APPENDIX A

Literature review of the presence of pleural effusions in benign schwannomas

A literature search was undertaken using Ovid Medline 1946 to present. The search terms included the MeSH headings 'neurilemmoma' and 'pleural effusion' as well as keyword searches for 'Schwannoma', 'neurilemmoma', 'pleural effusion' and 'benign'. Results were limited to English language papers. Nine papers were identified, and review of reference lists revealed a further 3 papers. Abstracts were read for all papers, and full text obtained for papers that included patients with benign effusions and schwannomas. The four relevant papers are summarised below.

In 1998, Lee et al described a case of a 27 year old man with 1 week's history of left-sided loin pain and signs of a left pleural effusion.¹ He had sustained a blow to the left side of his chest during a 'play-fight' four days earlier. CT revealed a large left pleural effusion, from which 3L of blood-stained fluid was drained via a chest drain. Post-drainage CT showed a mass in the left paravertebral gutter, which was biopsied to reveal fibro-adipose tissue. He underwent surgical resection, during which a 6x5x4cms mass was seen arising from the 7th intercostal nerve. This was removed. Histology revealed a spindle cell tumour with extensive intra-tumoural haemorrhage and haemosiderin staining. Strong S-100 staining diffusely across the tumour allowed the diagnosis of a schwannoma to be made.

More recently (2011), Morimoto and colleagues reported a case of a 37 year old woman who presented with left sided back pain and a bloody pleural effusion.² She underwent magnetic resonance imaging (MRI), which revealed a 76mm tumour arising from the 9th intercostal nerve. The tumour was completely resected and histologically showed spindle cells with a biphasic pattern. Cystic degeneration and haemosiderin deposition were noted. Tumour cells were positive for S-100 staining, hence schwannoma was confirmed.

Jang et al present a similar history in 2013.³ Their patient, a 36 year old lady, presented with complete opacification of her right hemi-thorax on chest x-ray due to fluid and tumour. She underwent video-assisted thoracoscopic surgery (VATS), but the procedure was converted to an open thoracotomy in order to allow complete resection of the mass. The 10x12x3cms tumour was confirmed as a schwannoma on histology. The patient's post-operative course was complicated due to pulmonary oedema a few hours after the operation. This was assumed to be due to removal of the large effusion.

Finally Ishibashi et al describe a case of a 73year old man in whom intra-tumoural bleeding was demonstrated by MRI at the time of presentation.⁴ The patient presented in hypovolaemic shock with no history of trauma. CT imaging revealed a massive pleural effusion and 46x60mm paraspinal mass. A chest drain was inserted and 1700ml of blood drained. T2-weighted MRI images undertaken at the time showed high signal intensity inside the mass, suggesting intra-tumour bleeding. The patient underwent VATS, during which a ruptured and actively bleeding tumour was discovered adjacent to the vertebra at the level of the 8th rib. The bleeding was arrested and the tumour was successfully excised. Histology revealed a schwannoma.

These cases confirm that, although rare, benign schwannomas do present with pleural effusions. When this does occur, the effusions tend to be large and blood-stained. Subsequent histological examination of these tumours supports the theory that the effusion arises as a result of spontaneous tumour haemorrhage or rupture.

References

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2. Morimoto J, Nakajima T, Iizasa T, et al. Successful resection of schwannoma from an intercostal nerve causing bloody pleural effusion: Report of a case. *Surgery Today* 2011;41(7):989-91. doi: 10.1007/s00595-010-4379-9
3. Jang JY, Kim JS, Choe JW, et al. A Case of Giant, Benign Schwannoma Associated with Total Lung Collapse by Bloody Effusion. *Tuberculosis and Respiratory Diseases* 2013;75(2):71-74. doi: 10.4046/trd.2013.75.2.71
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