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Recurrent laryngeal nerve palsy secondary to massive venous thrombosis

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Abstract

Retrospective review of all patients with recurrent laryngeal nerve palsy seen at a comprehensive cancer centre over a 30 month period has revealed three patients with this diagnosis apparently related to massive venous thrombosis. All three patients had an underlying diagnosis of malignancy (two colon, one breast) and an indwelling central venous access device with its tip in the superior vena cava. Direct laryngoscopy was otherwise normal in all patients, and two had normal CT scans of the neck and mediastinum. This third patient had mediastinal adenopathy, but this was unchanged from the previous nine months. Although two patients expired shortly after this presentation, the other patient lived for one year and his palsy resolved with the resolution of his superior vena cava syndrome. Mediastinal inflammation secondary to the thrombophlebitis may be the direct cause of this unusual presentation.

Key words: Recurrent laryngeal nerve palsy; Thrombophlebitis; Catheterization, central venous.

Introduction

The utilization of permanent central venous access devices (CVAD) has markedly increased over recent years, especially in the patient population requiring chemotherapy access. Consequently, we have seen several resultant complications reported, most commonly infectious and/or thrombotic. We report three patients with indwelling catheters who presented with recurrent laryngeal nerve palsy (RLNP), presumably related to a thrombophlebitic complication.

Materials and methods

Approximately 1,000 CVAD were surgically placed over a thirty month period from January, 1988 to June, 1990 at the Fox Chase Cancer Center. During this same period of time, we noted 31 cases of RLNP which were not the direct result of laryngeal or hypopharyngeal neoplasms (Table 1). Of these cases recorded, sixteen were secondary to lung carcinoma, seven secondary to 'miscellaneous' carcinomas, one lymphoma, one iatrogenic injury, three idiopathic, and three coinciding with the actual presentation of a massive venous thrombophlebitis. It is this last group of three patients that we report.

TABLE I
AETIOLOGY OF RECURRENT LARYNGEAL NERVE PALSY

Aetiology	Number of patients
Lung carcinoma	16
Idiopathic	3
Venous thrombophlebitis	3
Thyroid carcinoma	2
Oesophageal carcinoma	2
Breast carcinoma	1
Nasopharyngeal carcinoma	1
Rectal carcinoma	1
Lymphoma	1
Iatrogenic	1

Case reports

Case 1

A sixty-year-old male was diagnosed as suffering from adenocarcinoma of the colon and multiple liver metastases in December, 1987. Following surgery, a right-sided CVAD was inserted, and treatment with weekly 5-Fluorouracil and Cisplatinum was instituted. In April, 1988 he presented to the hospital with progressive hoarseness and a bilaterally acutely swollen neck which was very tender, erythematous, and warm to touch. Subsequent laryngoscopy revealed a right RLNP without other abnormalities, and CT scanning of the neck and chest revealed a thrombosed superior vena cava and marked inflammatory changes of the superior mediastinum and soft tissues (Fig. 1). The bilateral internal jugular veins were occluded by thrombus (Fig. 2). No tumour was seen within the mediastinum or bilateral cervical regions. A contrast study through the CVAD revealed thrombosis of the superior vena cava and right brachial cephalic vein.

The CVAD was subsequently removed, and anticoagulation therapy begun. The superior vena cava syndrome resolved, and voice quality was reported to return to baseline. The patient subsequently expired secondary to progressive disease 10 months later, without evidence of intrinsic laryngeal or mediastinal neoplasm.

Case 2

A 69-year-old white male was diagnosed as suffering from adenocarcinoma of the colon, Duke's C2, in April, 1988. After subsequent presentation of a liver and lung metastasis, a left-sided CVAD was placed in July 1989 and treatment with ethacrynic acid and thiotepa was instituted. He presented to the hospital one month later with left shoulder pain, a new onset of hoarseness, chronic abdominal pain, and subsequent respiratory distress and sepsis. Laryngoscopy revealed a left RLNP without other abnormalities noted, a contrast study was consistent with left brachial cephalic thrombosis, and CT of the neck and chest

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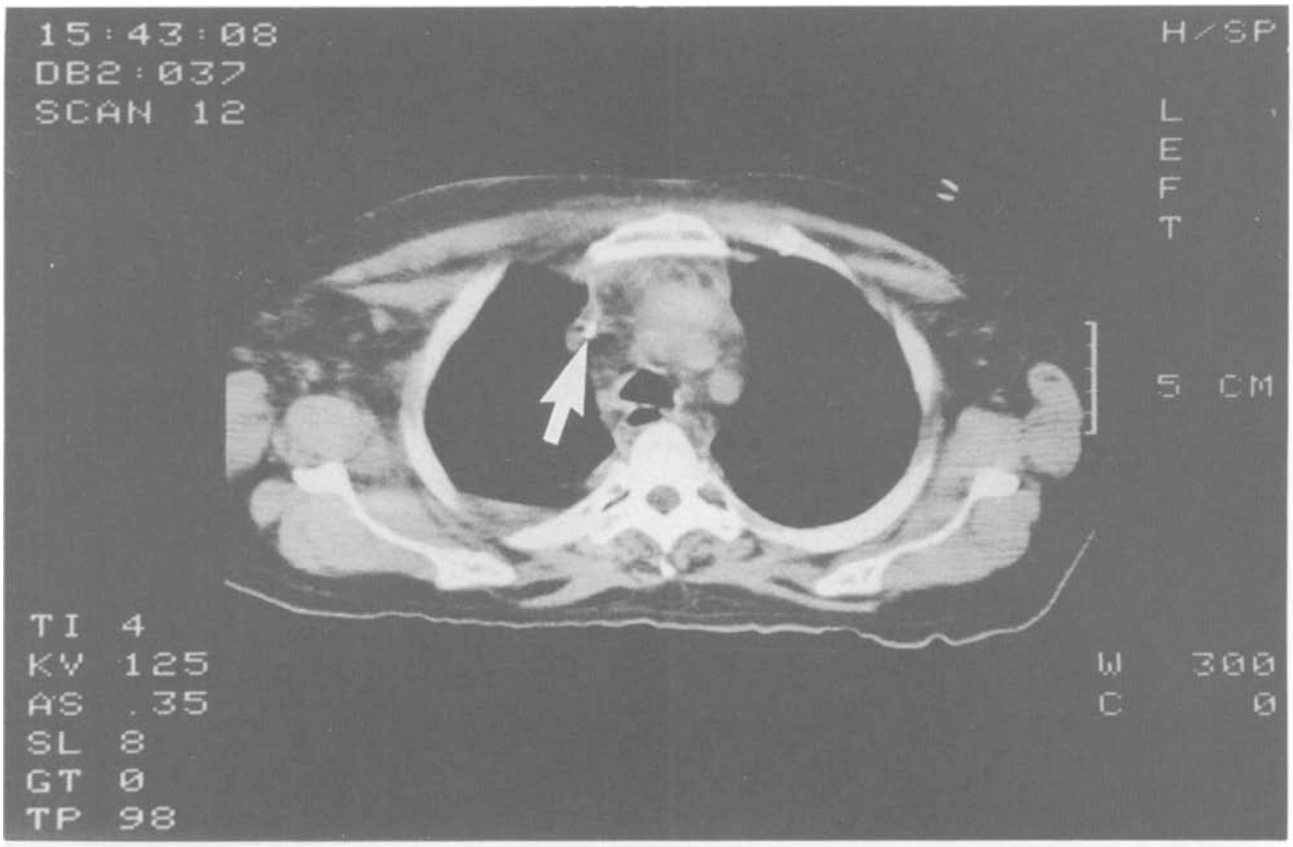

FIG. 1:
Case 1 CT scan
Catheter (white) lying in superior vena cava. Note the marked inflammatory changes in the superior mediastinum without evidence of mediastinal tumours.

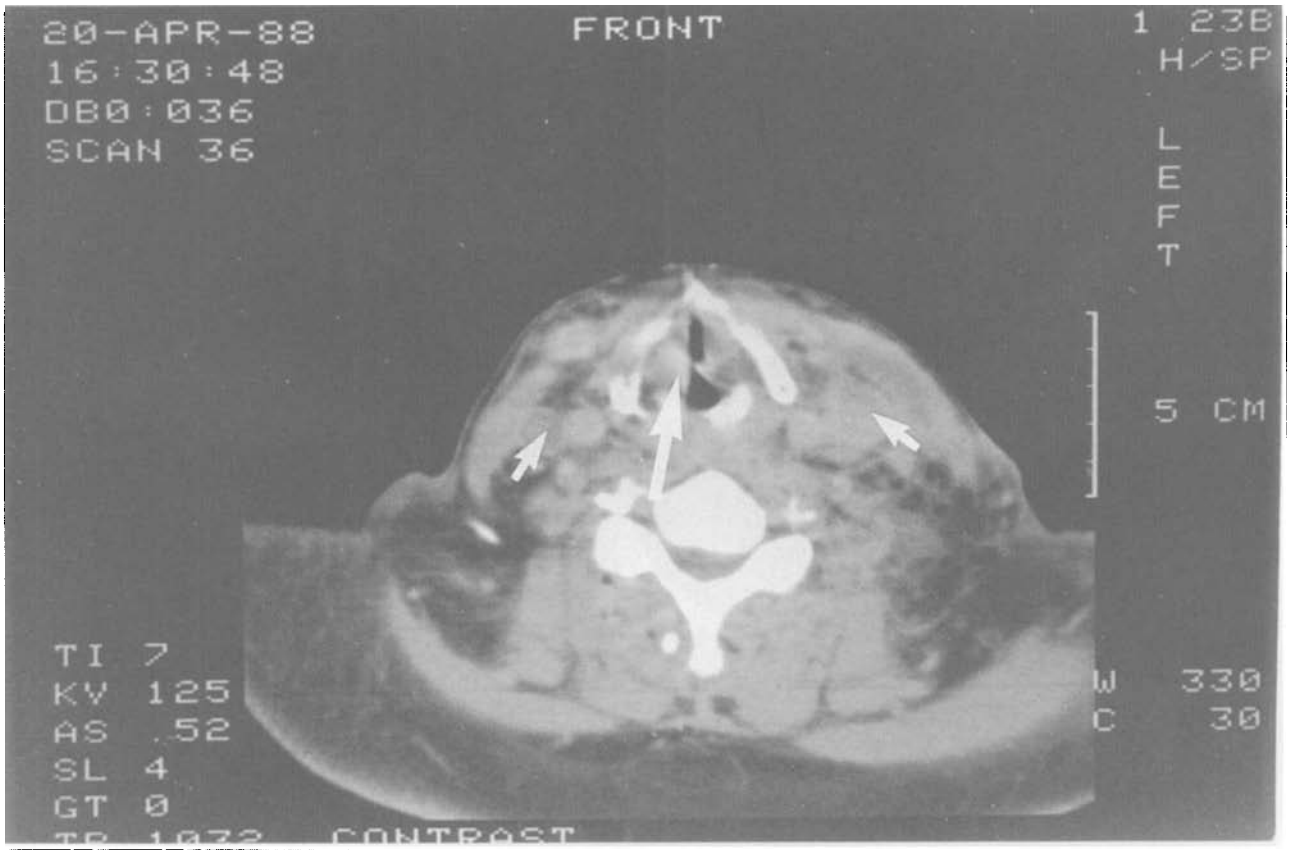

FIG. 2
Case 1 CT scan
The right vocal fold is resting at the midline (large arrow). Bilateral internal jugular vein thrombosis again noted (smaller arrows).

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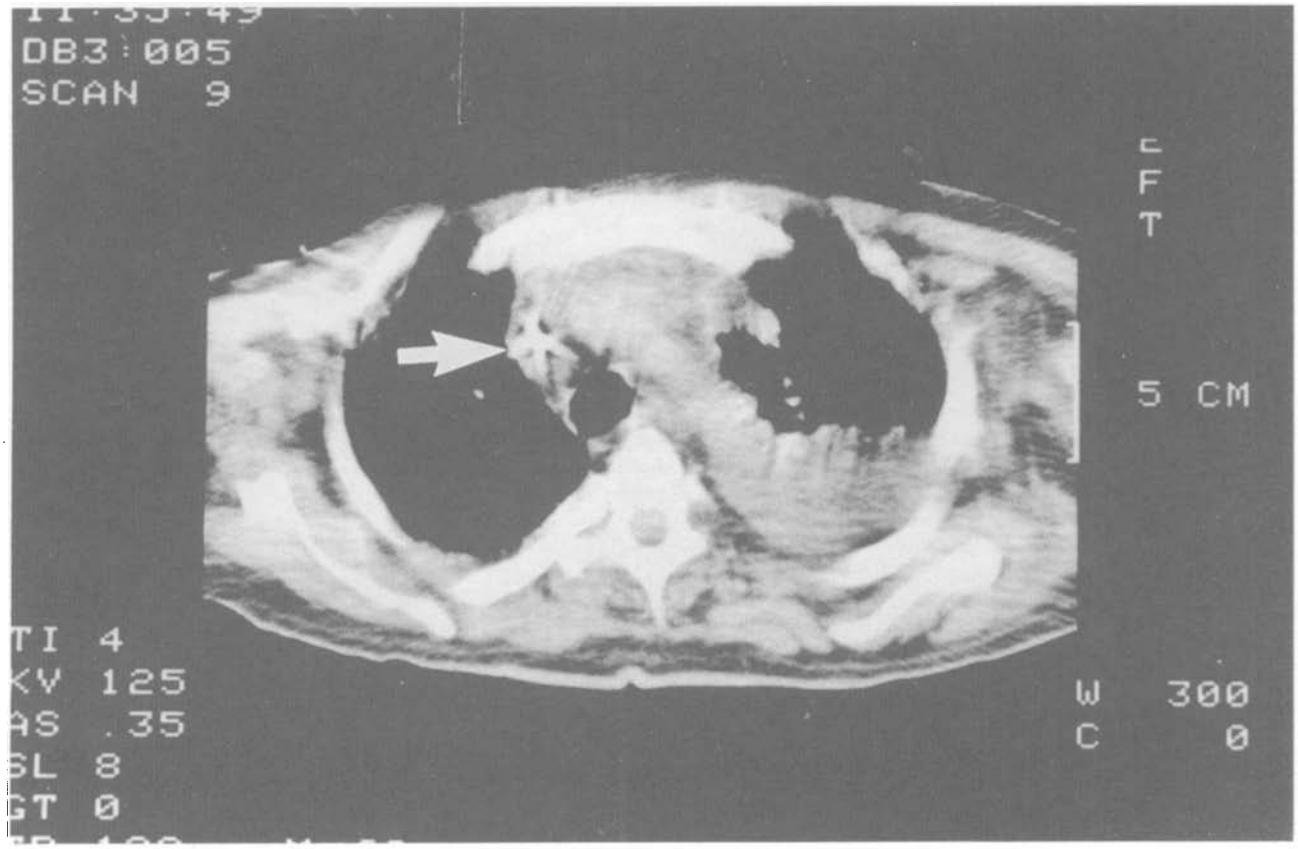

FIG. 3:
Case 2 CT scan
Catheter seen lying in SVC (arrow). Note marked inflammatory changes in the superior mediastinum, without evidence of mediastinal tumour. Left pleural effusion also seen.

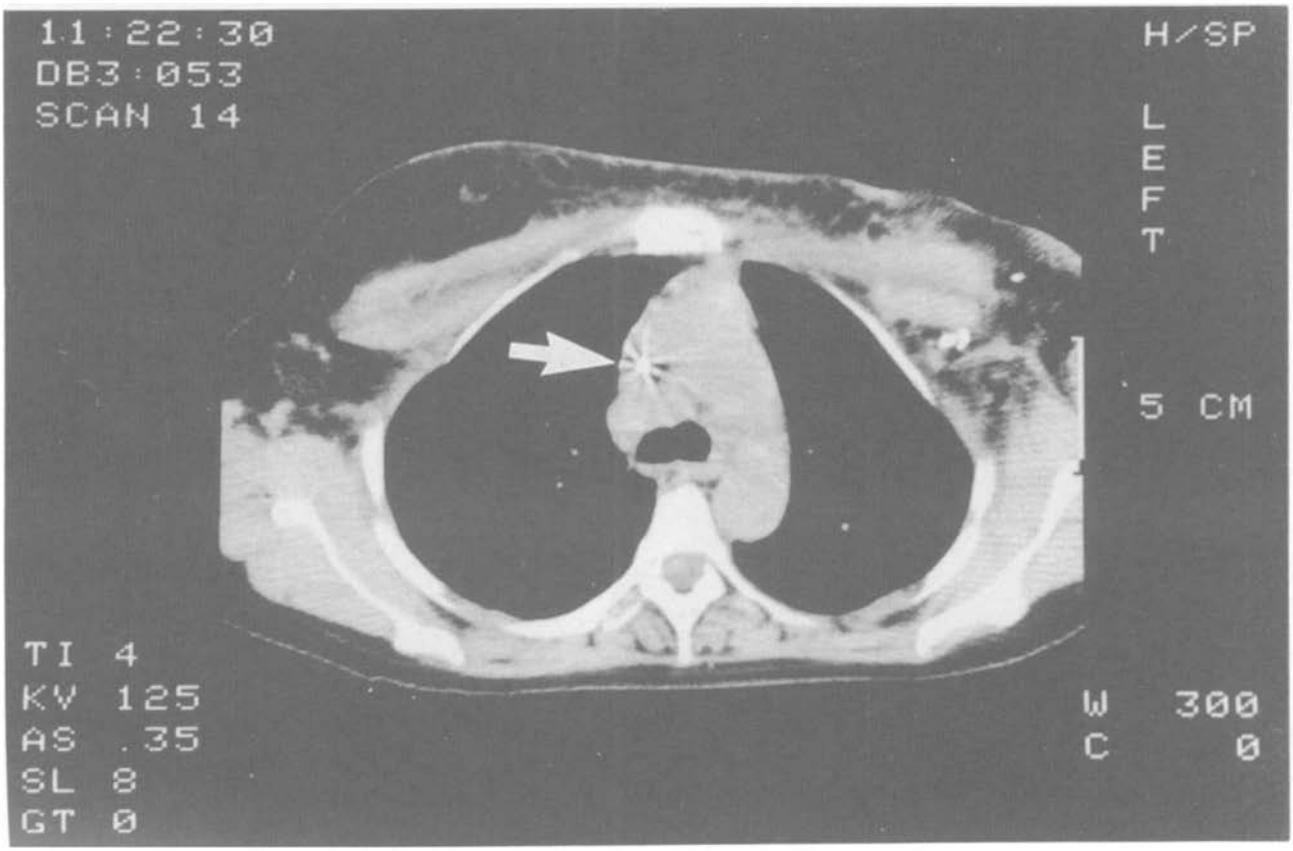

FIG. 4:
Case 3 CT scan
Catheter seen in SVC (arrow). Mediastinal tumour is present.

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revealed inflammatory changes of the mediastinum, left axilla, and left supraclavicular region without signs of neoplasm (Fig. 3). The CVAD was noted top have a 'thick fibrin sheath' when it was removed and the thrombus grew candida and multiple gram negative rods when cultured. The patient soon expired secondary to overwhelming sepsis and multiple organ failure.

Case 3

A 49-year-old black female had undergone a left modified radical mastectomy in April, 1989 for infiltrating ductal carcinoma of the breast. Post-operatively, she received six cycles of cytoxan, adriamycin and 5-Fluorouracil. She subsequently developed left supraclavicular and left cervical metastasis as well as a second primary in the right breast. A right-sided CVAD was placed in January, 1990, and treatment with weekly 5-Fluorouracil was started, later being changed to mitomycin and velban. Three months later she presented to the hospital with a seven day history of 'swelling and pressure in the face, neck, arms, and upper chest', followed by the development of stridor. The clinical picture was consistent with an acute onset of superior vena cava syndrome and secondary massive oedema of the head and neck as well as the upper extremities. Laryngoscopy revealed a left RLNP and a 'sluggish' right vocal fold without other abnormalities noted. CT scan of the neck and chest revealed superior mediastinal adenopathy, unchanged from an examination nine months previous (Fig. 4). A contrast study confirmed thrombosis of the left subclavian vein, and was consistent with superior vena cava syndrome. Anticoagulation therapy was begun as well as emergency radiation therapy to the mediastinum. She subsequently expired approximately eight weeks later due to progressive disease.

Discussion

All three patients presented with an indwelling permanent CVAD and the acute diagnosis of massive venous thrombophlebitis at the time of their recurrent laryngeal nerve palsy. Two out of three patients had no other explanations for this palsy based on physical examination, direct laryngoscopy, and CT scanning of the neck and chest. Furthermore, the third patient had stable mediastinal adenopathy over a several month period of time prior to the development of the superior vena cava syndrome, suggesting the indwelling catheter as a cause of the thrombophlebitis and not the metastatic mediastinal disease. This would then imply that the acute presentation of thrombophlebitis was the aetiology of the RLNP and not the long standing stable mediastinal metastasis.

CT scanning has been previously shown to be instrumental in the workup of extralaryngeal causes of RLNP (Glazer *et al.*, 1983). The tremendous mediastinal inflammation seen in these patients' CT scans are a direct result from the acute thrombophlebitis. Other inflammatory/vasculitic causes of RLNP have been reported (Parnell and Brandenburg, 1970; Maisel and Ogura, 1974; Gordon, and Dunn, 1990). Furthermore, other disease processes affecting the great vessels, such as pulmonary hypertension or thoracic aortic aneurysm, have been reported to cause RLNP (Yu, 1958; Asherson *et al.*, 1983; Asherson and Hughes, 1985; Asherson *et al.*, 1986; Aszkenasy *et al.*, 1987; Teixido and Leonetti, 1990).

Prior to the frequent utilization of CVAD for chemotherapy, central venous access catheters accounted for only 4 per cent or less of superior vena cava syndrome reported in the literature (Lochridge *et al.*, 1979; Parish *et al.*, 1981). As the use of these devices has increased over the last several years, the reported incidence of thrombotic complications has also increased (Belcastro *et al.*, 1990; Claessen *et al.*, 1990; Kerr, 1990; Williams, 1990). Some of this is due to the hypercoagulable state of patients with solid tumours as well as the local irritant effects of chemotherapy.

Three episodes of major thrombophlebitis of the superior vena cava or its major tributaries have been presented here, which have not only resulted in significant sequela due to mechanical venous obstruction and sepsis, but have also been implicated as the cause of RLNP. This represents a unique aetiology of RLNP which has not been previously reported.

Conclusion

Recurrent laryngeal nerve palsy is usually the result of neoplasm or trauma. We report three cases of RLNP presumably secondary to massive venous thrombophlebitis. As the utilization of permanent indwelling central venous access device continues to increase, we would anticipate additional reports to confirm our findings.

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