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The long term clinical course of acute deep vein thrombosis of the arm: prospective cohort study

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Introduction

The diagnosis and treatment of deep vein thrombosis of the arm are documented extensively.[1 2] The long term clinical course of the condition is, however, poorly defined.

Participants, methods, and results

Fifty three consecutive patients with a first, symptomatic deep vein thrombosis of the arm, confirmed by ultrasonography or venography—including six cases related to catheter insertion—were treated with high dose heparin, followed by at least three months of warfarin (targeted international normalised ratio 2.0-3.0) (table).

Follow up visits were scheduled after three and six months, and then every six months up to five years. At each visit, patients underwent a clinical evaluation, for which we used a standardised scale previously validated in patients with venous thrombosis in the leg,[3 4] and an ultrasound assessment of the affected venous segments. Each of five symptoms (heaviness, pain, itching, physical limitation, and paraesthesia) and six signs (pretibial oedema, skin induration, discoloration, venous ectasia, redness, and pain during compression) received a score ranging from 0 to 3. We defined post-thrombotic syndrome as severe in the case of a score higher than 14 and as mild in the case of a score of 5-14, on two consecutive examinations. We considered veins as recanalised if they measured less than 2.0 mm in diameter in a single examination or less than 3.0 mm in two consecutive examinations at least three months apart.

Symptomatic recurrent thrombosis in the same arm was diagnosed in case of a (new) intraluminal defect on venography, while symptomatic recurrences in other limbs were diagnosed in case the vein could not be compressed on ultrasonography.[1 5]

We used Kaplan-Meier estimates to assess the risk of recurrent thromboembolism and post-thrombotic syndrome. We used stepwise Cox regression models to calculate hazard ratios for these outcomes in relation to age, sex, extension of thrombosis (single spot versus axillary or subclavian involvement), modality of clinical presentation (idiopathic versus secondary), thrombophilic status, acquired risk factors of thrombosis, and persistent venous obstruction. All patients gave written informed consent.

Two patients were lost to follow up after two and three years, respectively, and 11 died because of cancer progression, pulmonary embolism, and congestive heart failure.[1] Median follow up was 48.3 months.

Three patients developed a recurrent thromboembolism (recurrence in the same arm in two, and a thrombosis in the leg in one). The cumulative incidence of recurrent thromboembolism after one, two, and five years was 2.0% (95% confidence interval 0.0 to 5.9), 4.2% (0.0 to 9.9), and 7.7% (0.0 to 16.5), respectively. Thirteen patients developed post-thrombotic syndrome, one severely so. Ten cases occurred within six months, two after one year, and one after two years. The cumulative incidence of post-thrombotic syndrome was 20.8% (9.3 to 32.3) at six months, 25.1% (12.8 to 37.4) at one year, and 27.3% (14.6 to 40.0) at two years. It remained stable afterwards. The incidence of these outcomes in patients with and without vein catheter is shown in table A on bmj.com.

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An additional table showing outcomes in patients with and without vein catheters is on bmj.com

Characteristics of the study patients (n=53). Values are numbers (percentages) of patients unless otherwise indicated

Characteristics	
Mean age in years (SD)	44.3 (18.5)
Male sex	31 (58.5)
Location of thrombosis:	
Isolated brachial	4 (7.5)
Axillary vein	6 (11.3)
Subclavian vein	14 (26.4)
Axillary and subclavian veins	29 (54.7)
Concomitant symptomatic pulmonary embolism	6 (11.3)
Risk factors for thrombosis	
Thrombophilia*	12 (22.6)
Unusual exercise	11 (20.7)
Active cancer†	11 (20.7)
Recent (<4 weeks) trauma or fracture	6 (11.3)
Previous leg vein thrombosis	6 (11.3)
Recent (<4 weeks) surgery	3 (5.7)
Outlet thoracic syndrome	3 (5.7)
Obesity	3 (5.7)
Heart failure	2 (3.8)
Oestrogens (% women)	5/22 (22.7)
Pregnancy (% women)	1/22 (4.5)
Combination of inherited and acquired risk factors	9 (17.0)
None	8 (15.1)
Initial treatment	
Unfractionated heparin	43 (81.1)
Low molecular weight heparin	10 (18.9)
No of months of follow up	
Median duration (range)	48.3 (1-60)
Median duration of anticoagulant treatment (range)	3 (1-40)‡

*Factor V Leiden in six patients, deficiency of protein C in three, deficiency of antithrombin in two, and prothrombin gene mutation in one.
†Already known or detected during hospitalisation.
‡Longer than six months in four patients.

Residual thrombosis was related to the incidence of post-thrombotic syndrome (hazard ratio 4.0, 1.1 to 15.0). Of other potential risk factors, only thrombosis affecting the axillary and subclavian veins was related, albeit not significantly, to the development of post-thrombotic syndrome (hazard ratio 2.9, 0.8 to 10.7).

Comment

Symptomatic deep vein thrombosis of the arm carries a low risk of recurrent thromboembolism. Post-thrombotic sequelae occur in almost one fourth of patients within the first two years and are related to residual thrombosis and, to a lesser degree, to the extent of the initial thrombosis. The rates of recurrent thromboembolism and post-thrombotic syndrome are lower than those observed in cohorts of patients with venous thrombosis of the leg.[4] Whether the incidence of long term sequelae might be further reduced by physical devices or other methods is worth investigating.

Contributors: PP, AWAL, AG, and EB conceived and designed the study. PP, AWLA, MHP, and EB drafted the article. MHP and AM offered their statistical expertise for analysing and interpreting data. PP, SV, PB, DS, AP, and PS provided study patients and collected data by following them prospectively over years. AG, AP, AM, and PS critically reviewed the article for important intellectual content. All authors approved the final version of the article. PP is guarantor.

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Sir Gordon Gordon-Taylor and me

In the late 1950s I became a surgical registrar at a well known hospital in South Wales, though I was still unsure where my future might lie. Shortly after my arrival, there was general excitement that the (reputedly) greatest living British surgeon, Sir Gordon Gordon-Taylor, had accepted an invitation to come from London to see an unfortunate patient who had a malignant tumour affecting his pelvis. Subject to the patient's agreement and Sir Gordon's opinion, it was felt that a hindquarter amputation might be the only possible treatment.

Sir Gordon was kindly and charming, dressed as the archetypal surgeon with a double breasted suit, bow tie, and a pink carnation in his buttonhole. Despite his fame, he had not lost the common touch and spoke with genuine interest to everyone he met, particularly the most junior doctors and nurses. I have since calculated, to my great surprise, that he was at least 80 at the time.

The amputation went well. Sir Gordon was assisted by three consultants, and, as the fourth assistant, I had little to do apart from carrying away a very large specimen. Sir Gordon was at pains to ensure that all could observe how the procedure went. For the most part, he used only a scalpel with bold and graceful strokes, and stood back while his highly skilled assistants controlled the bleeding and ligated the main vessels.

As is the custom with visiting luminaries, he was asked to give advice about other problematic patients. One, who had just been admitted, was a middle aged man with a six month history of a massive, fixed, and painless swelling of his right shoulder, which was thought probably to be a soft tissue sarcoma. My consultant and I escorted Sir Gordon to see this patient, for whom he agreed that a forequarter amputation might be considered, but noted that a biopsy had not yet been done, and I was instructed to do this.

The biopsy, performed the next day under general anaesthesia, resulted in the release of a huge volume of pus and the cure of the patient. Delightedly, he went home a day or so later, performing windmill movements with his hitherto useless right arm. I never saw anything similar in the rest of my clinical career.

Sir Gordon was the first really famous medical person that I had met. I cannot say that the experience convinced me that I should pursue a career in surgery, but he did make other careers seem less interesting. Unfortunately, he died a year or so later after an accident.

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