20.

Proc. 7th Congr europ. Soc. Haemat., London 1959; part II, pp. 638–641 (1960).

*188*

# Surgery in Patients on Oral Anticoagulant Treatment

P.F. HJORT and C.F. BORCHGREVINK

Institute for Thrombosis Research, University Hospital, Rikshospitalet, Oslo, Norway

We are concerned here with two complications of surgery: bleeding and thromboembolism. Both are dangerous, and may be fatal. The problem is difficult, since there is no general solution which will work for all types of operations in all patients.

Most of us fear bleeding more than thromboembolism, possibly because bleeding is a man-made complication, while thromboembolism may be considered as an act of fate. Therefore, if any risk has to be taken, we prefer the risk of thromboembolism. This is highly unrealistic, however, since bleeding generally is less dangerous, and easier to treat than thromboembolism.

Therefore, anticoagulants sometimes have to be used in surgery. If we restrict ourselves to the oral anticoagulants, the problem has two aspects: (1) Should patients who have an increased risk of thromboembolism be given anticoagulants even *before* operation? This problem has been carefully worked out by STORM (1958). (2) Should a patient who already is on anticoagulant treatment for cardiovascular disease be taken off treatment or given less intensive treatment if surgery becomes necessary? This has become a practical problem to us, and as the use of continued anticoagulant therapy is increasing, this problem will be met more and more frequently.

To answer this question, one has to consider its two sides. First, how large is the risk of bleeding during operations on patients who are on anticoagulant treatment? Secondly, how large is the risk of thromboembolic complications when treatment is stopped before surgery? The first question has been answered by STORM who found that adequate anticoagulant treatment did not increase bleeding during or after major operations. We have had the same experience in 19 patients who have had 55 tooth extractions while on adequate anticoagulant treatment for cardiovascular disease. By adequate treatment we mean a P- and P-level of 10 to 30 %. Tooth extraction is a small operation, but it is notorious for delayed bleeding in patients with congenital disorders of coagulation. The lack of bleeding in our patients is therefore a significant observation. The dentist knew that the patients were on anticoagulant treatment, and worked carefully. The material does therefore not prove that these patients had no increased bleeding tendency whatsoever, but it does prove the practical point that it is *possible* to operate on such patients without serious bleeding. This is confirmed by a small series of different operations which became necessary in nine patients on permanent anticoagulant treatment for cardiovascular disease. Again there was no bleeding, except in one woman with longstanding diabetes and hypertension.

The bleeding time is not prolonged in patients with congenital clotting defects, and yet these patients bleed at operations. The bleeding time as it is usually performed therefore does not reflect the bleeding tendency of a patient. However, we have found that the so-called "secondary bleeding time" is always prolonged in patients with defects in the intrinsic clotting system. The secondary bleeding time is based on the observation that wounds in a haemophilic patient generally do not bleed at first, but start to bleed several hours later. Therefore, we first examined the bleeding time with the Ivy method, and one day later removed the crust from the wound. The bleeding time was then measured for a second time. In order to correlate the secondary bleeding time with the level of antihaemophilia B factor, a patient with haemophilia B was transfused up to different levels of the antihaemophilia B factor. The secondary bleeding time was not prolonged when the level was above 10–15 % (BORCHGREVINK and WAALER, 1958). In patients on anticoagulant treatment the test becomes abnormal only when the P- and P-level is less than 10–20 % (Fig. 1). Thus, there is good correlation between this test and the clinical experience, indicating that there is a minimal risk of bleeding in patients whose P- and P-level is between 10 and 30 %.

The other side of the problem, thromboembolism in patients who are taken off treatment before surgery, depends on the underlying disease. In the small group of patients with rheumatic heart disease and previous cerebral embolism the risk is very large. The risk in coronary disease is difficult to estimate, since a controlled trial has never been carried out to elucidate this problem. Clinical experience indicates, however, that the risk is far from negligible. Of 832 patients on long-term anticoagulant treatment for coronary disease who were controlled in our department, 53 discontinued treatment after an average treatment time of 2.7 years.

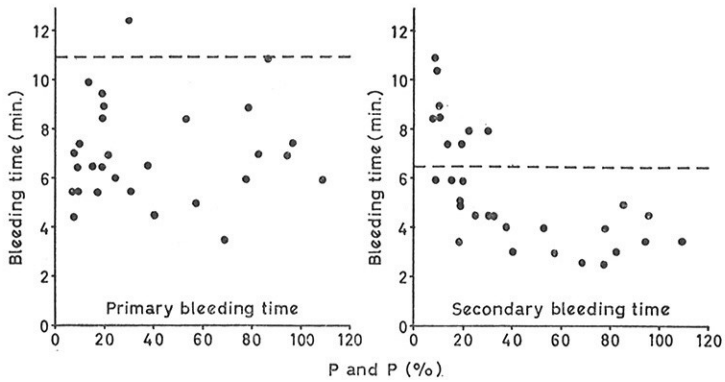


*Fig. 1.* The primary and secondary bleeding time in patients on long-term anticoagulant treatment for cardiovascular disease.

The reason was either that they had become free of symptoms, that there had been no improvement in symptoms, or that they felt worse. Although this group is not representative of the whole group, it is important to learn the fate of these patients. One third of them died within the first year after treatment had been stopped. This mortality should be compared with a death rate of 5 % in the treated group (OWREN, 1958). It is true that most of these patients did not die immediately, and we may therefore have overemphasized the risk of discontinuing treatment for only a short time. However, we have seen cases where infarction immediately followed when treatment was stopped. Probably, an operation will also add to the risk of withdrawal.

*Table I*

Preliminary Results of a Controlled Clinical Trial Concerning the Effect of Anticoagulant Treatment of Coronary Disease (Infarction or Angina Pectoris). The Patients were Allocated at Random to One of Two Groups. The First Group was Maintained at a P- and P-level of 50 %, the Other at 20 %.

| | P.- and P.-Level | |
|---|---|---|
| | 15–25 % | 50–60 % |
| Number of patients | 88 | 85 |
| Myocardial infarction | 1 (1 %) | 9 (11 %) |
| Cardiac deaths | 1 (1 %) | 6 (7.5 %) |
| Other thrombo-embolic episodes | — | 2 |
| Bleeding complication | 3 | — |

Surgeons in Norway tend to escape the problem by compromising. They reduce the dose, and bring the P- and P-level up to about 50 %, knowing that this eliminates the risk of bleeding, and hoping that the protection against infarction may still be adequate (Tab. I). This assumption is probably not correct, since we have

found that a level of 50 % gives a poorer protection than a level of 20 % (Borchgrevink, 1959).

In *conclusion* we feel that operation can generally be carried out without abnormal bleeding in patients on anticoagulant therapy, and we believe that reducing or stopping the treatment even for a few days, may be dangerous. Consequently, we recommend that patients who are on anticoagulant therapy should be kept in the therapeutic range even during operations. No dogmatic solution to this problem should be proposed, but each patient should be considered as an individual problem. There is a greater danger of bleeding if the patient has hypertension, if a bleeding following the operation would be disastrous, such as in the eye or in the central nervous system, or if the operation normally carries a large risk of bleeding, such as, for instance, prostatic surgery. On the other hand, the danger of thromboembolism is greater if the patient is old, if he has serious cardio-vascular disease, if he has had previous incidents of thromboembolism, and if the operation carries a large risk of thromboembolism, such as intrathoracic or vascular surgery.

### *References*

Borchgrevink, C.F.: Discussion on long term anticoagulant treatment. C.I.O.M.S., Conference on Controlled Clinical Trials. Vienna 1959 (Blackwell, Oxford 1960).

Borchgrevink, C.F. and Waaler, B.A.: The secondary bleeding time. Acta med. scand. *162:* 361–374 (1958).

Owren, P.A.: The selection of patients with rheumatic heart disease and coronary heart disease. Proc. Seventh Int. Congr. Haemat. Rome 1958, *3:* 760–766 (Il Pensiero Scientifico, Rome 1960).

Storm, O.: Anticoagulant protection in surgery. Thromb. diath. Haem. *2:* 484–491 (1958).

### Discussion

H. Lempert (Manchester): I would like to endorse the speaker's remarks by quoting an example from our own series. A patient on anticoagulant therapy with phenylindanedione for myocardial infarction suddenly developed appendicitis after three weeks of treatment. The prothrombin time by the one-stage method had been in the region of 25 to 35 seconds (normal 11 to 12 seconds). It was in the days before vitamin $K_1$ was available but Synkavit was administered intravenously. Eight hours later the prothrombin time was 19 seconds and appendectomy was performed. There was no excessive bleeding and the patient made an untoward recovery.

H.A. Thies (Hamburg, Deutschland): Vom 1.5.1948 bis 1.5.1959 erhielten in unserer Klinik 10436 Patienten Antikoagulantien, und zwar 1835 Kranke aus therapeutischen und 8201 Kranke aus prophylaktischen oder experimentellen Gründen.

Außer bei Kontraindikationen führten wir eine generelle Prophylaxe durch. Der Cumarineffekt wurde nur mit der Thromboplastinzeit am Krankenbett und mit selbst hergestellten humanen Cerebralthrombokinasen überwacht. Unsere Resultate:

Beim Quick-Wert unter 30 % keine frische Thrombose und keine schwere Embolie und nur 5 leichte Embolien. Dies ergibt eine Blutungsfrequenz von 0,8 %.