Thromboembolism has been frequently reported in cancer patients, mainly in cases with solid tumors. Besides in several animal models, fibrin deposition around the tumor and platelet aggregates appear to be involved in invasion and metastasis. This study was aimed at evaluating the extent of in vivo platelet activation and fibrin formation in several kinds of human cancer. We excluded from this study patients whose blood was sampled with difficulty as those having clinical evidence of thrombosis or embolism, those with thrombocytopenia, increased fibrinogen degradation products or biological pattern of disseminated intravascular coagulation. Fibrinopeptide A (fPA) and β-thromboglobulin (β-Tg) were determined by RIA. Free platelet count ratio (PCR) was determined on whole blood samples as an index of circulating aggregates. Usual coagulation tests, antithrombin III activity, protein C plasma level, F VIII related antigen (F VIII RAG), F VIII Ristocetin cofactor (F VIII RCF) and F VIII procoagulant activity (F VIII C) were also determined.

It was found that in more than fifty percent of patients, fPA was significantly increased above the upper reference limit. Cases with increased β-Tg were less frequent. Separate ties or embolism, those with thrombocytopenia, increased fibrinogen degradation products or biological pattern of disseminated intravascular coagulation. Fibrinopeptide A (fPA) and β-thromboglobulin (β-Tg) were determined by RIA. Free platelet count ratio (PCR) was determined on whole blood samples as an index of circulating aggregates. Usual coagulation tests, antithrombin III activity, protein C plasma level, F VIII related antigen (F VIII RAG), F VIII Ristocetin cofactor (F VIII RCF) and F VIII procoagulant activity (F VIII C) were also determined.

Increased level of fPA with normal β-Tg was frequent. Separate ties or embolism, those with thrombocytopenia, increased fibrinogen degradation products or biological pattern of disseminated intravascular coagulation. Fibrinopeptide A (fPA) and β-thromboglobulin (β-Tg) were determined by RIA. Free platelet count ratio (PCR) was determined on whole blood samples as an index of circulating aggregates. Usual coagulation tests, antithrombin III activity, protein C plasma level, F VIII related antigen (F VIII RAG), F VIII Ristocetin cofactor (F VIII RCF) and F VIII procoagulant activity (F VIII C) were also determined.

We conclude that platelet release and fibrin formation frequently occur in cancer patients showing no sign of thrombotic process. Increased level of fPA with normal plasma β-Tg level suggests that thrombin generation occurs only in the extravascular compartment, probably next to the tumoral tissues. Increased levels of plasma β-Tg with normal fPA levels may result from platelet activation by other stimuli than thrombin. It must be emphasized that normal PCR does not exclude the presence of fibrinous circulating aggregates which cannot be dispersed by EDTA. High F VIII activities may be due to the release of the von Willebrand factor from tumoral vessels.

In contrast, platelet aggregation induced by 5637 human bladder carcinoma cells was not inhibited by apyrase, but was abolished by hirudin, indicating the important role of thrombin in this effect. Tumour cells dissociated from 3 breast carcinomas showed a very high platelet aggregating activity, which was not inhibited by hirudin or apyrase, but was abolished by iodoacetic acid, suggesting a role for a cystein-protease in platelet activation.

These results confirm that platelets can be activated by tumour cells through different mechanisms; they also suggest that the methods employed to obtain the tumour cells can influence the results, probably because of the different cell populations which are present in the dissociated tumour tissues.

Information obtained with freshly dissociated cells are interesting, because this method has been used seldom so far and because it provides a more physiological approach to the study of the interactions of tumours and platelets.