Aspirin Does Not Increase Bleeding Complications After Transbronchial Biopsy*

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Study objectives: The present study was performed to determine whether the risk of bleeding after transbronchial lung biopsy is increased in patients taking aspirin.

Design: Prospective cohort study.

Patients and interventions: After excluding patients with other coagulation problems, 1,217 patients who had undergone transbronchial lung biopsy during a prospective 1.5-year study period were included in this study. The use of aspirin was not discontinued before the procedure. Two hundred eighty-five patients (23%) had consumed aspirin within 24 h of the procedure, and most of them (82%) used aspirin on a daily basis. Transbronchial biopsies were performed, and the bleeding incidence was compared between the groups.

Results: A total of 57 patients (4.7%) experienced procedure-related bleeding. Minor bleeding occurred in 5 of 285 patients (1.8%) taking aspirin and in 27 of 932 control patients (2.9%; not significant). Moderate bleeding was seen in 3 of 285 patients (1.1%) in the aspirin group and in 13 of 932 patients (1.4%) in the control group (not significant). Major bleeding occurred in only 9 patients, 2 of 285 (0.9%) in the aspirin group and 7 of 932 (0.8%) in the control group (not significant). All bleeding was controlled by endoscopic means, and there were no fatalities and no need for blood transfusions.

Conclusions: We conclude that the risk of severe bleeding after transbronchial lung biopsy is small (ie, < 1%) and that the use of aspirin is not associated with any increased risk of bleeding.

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Key words: aspirin; bleeding; bronchoscopy; transbronchial biopsy

Abbreviation: TBBX = transbronchial biopsy

Aspirin is widely utilized in the treatment of common ailments such as headache, myalgias, arthralgias, and various rheumatologic disorders. In addition, aspirin has been recommended for primary prevention of myocardial infarction,1 prevention of graft occlusion after coronary artery bypass grafting,2 and prevention of cerebral vascular accidents in patients with atherosclerotic vascular disease.3 It is currently estimated that > 25% of the general adult population consume aspirin or other nonsteroidal anti-inflammatory drugs on a regular basis.4,5

Aspirin is known to cause defects in platelet hemostatic metabolism by direct inhibition of cyclooxygenase activity and prostaglandin biosynthesis.6,7 Such effects result in the loss of platelet adhesive properties. The prolongation of bleeding times after aspirin use has been observed.8–11 The loss of platelet adhesion poses a theoretical risk for increased bleeding after surgical and other invasive procedures.

Transbronchial biopsy (TBBX) by bronchoscopy is a commonly performed procedure in patients with
parenchymal abnormalities. It is frequently recommended to discontinue the use of aspirin or other nonsteroidal agents several days prior to the procedure for fear that the bleeding risk may otherwise be increased. This practice has never been validated and potentially leads to the temporary discontinuation of a medication that has proven benefits and also delays the planned procedure.

This study was performed to assess the role of aspirin in the risk of bleeding associated with TBBX.

Materials and Methods

Study Population

All patients > 40 years of age undergoing bronchoscopy with TBBX during a 1.5-year period from July 1999 through January 2001 were evaluated. Patients were excluded from enrollment into the study if one of the following conditions existed: (1) the patient had received either warfarin or heparin therapy within 2 weeks of the endoscopic procedure; (2) the patient had a known history of a bleeding disorder; or (3) the patient had thrombocytopenia with a platelet count of < 50,000 cells/μL. The patient group taking aspirin was compared to the patients fulfilling enrollment criteria without taking aspirin. The study design was prospective.

Use of Aspirin

During the study period, patients were not encouraged to stop taking aspirin before their scheduled bronchoscopy with TBBX. Just prior to the procedure, patients were questioned regarding the individual use of aspirin (ie, indication and frequency). The procedure then was undertaken, and all necessary biopsies were performed. The operators were not aware of a patient’s aspirin use prior to the procedure.

Transbronchial Lung Biopsy

Fluoroscopy was used for all TBBXs. At least three specimens were taken with one standard forceps (FB-20C; Olympus; Tokyo, Japan). The intensity of bleeding was documented by the endoscopist. Bleeding was judged clinically by the need for clinical intervention. No bleeding was defined as traces of blood after finishing the biopsies without the need for continued suctioning. Mild bleeding was defined as the need for continued suctioning of blood from the airways after the procedure, and moderate bleeding was defined as requiring the intubation of the biopsied segment with the flexible bronchoscope into the wedge position. Severe bleeding was defined as the need for additional interventions such as placement of a temporary bronchus-blocker, application of a fibrin sealant, admission to a critical care unit, or the need for blood products.

Statistics

All values are presented as the mean ± SE. Statistically significant differences between patient groups were determined using Mann-Whitney U test.

Results

A total of 1,217 patients who had undergone bronchoscopy with TBBX satisfied the entry criteria and agreed to participate in this study. Of these patients, 285 (23%) had taken aspirin within 24 h of undergoing the endoscopic procedure, and 82% of these patients were taking aspirin on a daily basis and continued to do so after undergoing the endoscopic procedure. The most common reason for taking aspirin was primary or secondary prevention of coronary heart disease and the prevention of graft occlusion after coronary artery bypass grafting (Table 1).

The mean age of the patient population was 56.2 years (range, 40 to 82 years), 66% of patients were men, and 34% were women. Eight hundred fifty-four patients (70%) were smokers. Only the incidence of smoking was different between the two groups (ie, aspirin vs no aspirin), otherwise there was no statistical significance (Table 2).

The indications for TBBX were lung masses or nodules (932 patients; 76.5%), workup of presumed interstitial lung disease (168 patients; 13.8%), and the presence of infiltrates of unknown etiology (118 patients; 9.7%). The mean (± SD) number of biopsies specimens obtained per patient was 5.1 ± 2.4 (range, 3 to 12 specimens). There was no difference between the groups in number of biopsies and indications for the procedure.

Bleeding after TBBX was encountered in 57 patients (4.7%). Among those patients, bleeding was classified as mild in 32 patients (2.6%), moderate in

| Table 1—Indications for Aspirin Use in Patient Population (n = 285)* |
|-------------------------------|---------------------|
| Indication                   | No. (%)             |
| Prevention of CHD            | 145 (51)            |
| Prevention of post-CABG occlusion | 37 (13)           |
| Prevention of stroke         | 51 (18)             |
| Arthritis                    | 33 (12)             |
| Recent headache              | 19 (6)              |
*CHD = coronary heart disease; CABG = coronary artery bypass grafting.

| Table 2—Characteristics of the Study Population (n = 1,217)* |
|----------------------------------|---------------------|
| Characteristics | Aspirin Group (n = 285; No. (%)) | Control Group (n = 932; No. (%)) | p Value |
| Male               | 192 (67)             | 607 (65)             | NS      |
| Female             | 93 (33)              | 325 (35)             | NS      |
| Mean age, yr       | 54.2                 | 57.2                 | NS      |
| Smoker             | 216 (75)             | 637 (68)             | < 0.05  |
*NS = nonsignificant.
16 patients (1.3%), and severe in 9 patients (0.7%). There was no significant difference in the bleeding rate between aspirin users (10 of 285 patients; 3.5%) vs those not using aspirin (47 of 932 patients; 5%) [Table 3]. Major bleeding occurred in only 9 patients (0.7%), and there was no significant difference between the groups (Table 3). All nine patients with severe bleeding responded to topical endoscopic treatment, and none required intubation or admission to critical care areas. No transfusion of blood products was required.

Twenty-six patients (2.1%) developed pneumothoraces after undergoing TBBX. Fourteen of those were treated with tube thoracostomy, and in 12 patients observation alone sufficed. There was no statistical difference between aspirin users and control subjects. No other significant complications occurred with TBBX, and there were no deaths.

### Discussion

The use of aspirin is indicated for many conditions and has been found to be beneficial in many cardiovascular diseases. Frequently, the indicated use of this medication is interrupted for days if a patient is scheduled for elective TBBX, as has been recommended by some practitioners.13

Only very few studies have addressed the issue of coagulation defects and their influence on complications after endoscopic procedures.14 Interestingly, a study by Brickey and Lawlor15 in pigs treated with warfarin demonstrated no relationship between any prolonged international normalized ratio and bleeding after TBBX. Currently, there is no good evidence in the literature for the practice of discontinuing aspirin before undergoing endoscopic transbronchial lung biopsy.

Our study specifically addresses the incidence of bleeding associated with aspirin use in humans. In our patient population, the use of aspirin was frequent, and most of those patients used it daily, mainly for cardiovascular disorders or prevention. To rule out the influence of other coagulation problems, we excluded patients with thrombocytopenia or those who had recently used other anticoagulant drugs.

The degree of bleeding was described depending on the need for particular interventions rather than in absolute amounts, as this can be difficult to judge. Additionally, the need for clinical intervention seems to be the more relevant approach for the endoscopist and patient.

We could not demonstrate any difference in bleeding risk or pneumothorax between the two groups of patients. There was also no difference in the degree of bleeding, even in the patients with severe bleeding, as one may have expected more severely bleeding patients in the group of patients with platelet dysfunction. In fact, the risk of severe bleeding in our large study population of > 1,200 patients was < 1%.

In summary, we could not find clinical evidence for implicating aspirin in an increased risk of bleeding. Aspirin is frequently used for significant cardiovascular indications, and its discontinuation for endoscopic TBBX does not seem to be warranted.

### References


### Table 3—Incidence of Bleeding After TBBX*

<table>
<thead>
<tr>
<th>Bleeding</th>
<th>Aspirin Group (n = 285)</th>
<th>Control Group (n = 932)</th>
<th>p Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>5 (1.8)</td>
<td>27 (2.9)</td>
<td>NS</td>
</tr>
<tr>
<td>Moderate</td>
<td>3 (1.1)</td>
<td>13 (1.4)</td>
<td>NS</td>
</tr>
<tr>
<td>Severe</td>
<td>2 (0.9)</td>
<td>7 (0.8)</td>
<td>NS</td>
</tr>
<tr>
<td>Total</td>
<td>10 (3.5)</td>
<td>47 (5)</td>
<td>NS</td>
</tr>
</tbody>
</table>

*See Table 2 for abbreviations not used in the text.
nODULES. Chest 2000; 117:1049–1054