Anticoagulation Management without Cessation of Warfarin in the Periprocedural Period during Atrial Fibrillation Ablation

Gunma Prefectural Cardiovascular Center, Maebashi, Japan


Background

◆ Warfarin is often discontinued before atrial fibrillation (AF) ablation procedure, and intravenous heparin is used to 'bridge' the patients instead. However, this 'bridging therapy' may lead to the increasing risk of the thromboembolism and the bleeding.

◆ Though some papers about the AF ablation procedure, and the bleeding complications occurred in the same incidence rate as previously reported in the worldwide survey.

Method of Anticoagulation

◆ Preoperative period
Taking the same dose of warfarin orally.

◆ Preoperative period
Intravenous heparin was given every hour to keep the activated clotting time (ACT) over 300 seconds during the procedure.

◆ Preoperative period
Additional heparin was given according to the preoperative PT-INR for the overnight.

Table: Preoperative PT-INR and Post ablation heparin dose

<table>
<thead>
<tr>
<th>Preoperative PT-INR</th>
<th>Post ablation heparin dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT-INR &lt; 1.5</td>
<td>10,000 U/day</td>
</tr>
<tr>
<td>1.5&lt;PT-INR&lt;2.0</td>
<td>15,000 U/day</td>
</tr>
<tr>
<td>2.0&lt;PT-INR&lt;2.5</td>
<td>10,000 U/day</td>
</tr>
<tr>
<td>2.5&lt;PT-INR&lt;3.0</td>
<td>5,000 U/day</td>
</tr>
</tbody>
</table>

Average ACT : 303 sec
Total heparin dose : 7,220 U

◆ Representative Case - 63 y.o. Male Persistent af

- Preoperative period
PT-INR 3.05
- Perioperative period
Keep ACT over 300 seconds

ACT<br>Before administration: 500 sec<br>Continuous administration: 500 sec + 2.2

Average ACT: 284 sec<br>Total heparin dose: 7,220 U

Postoperative period
Additional heparin was given according to the preoperative PT-INR.

Check the PT-INR in the following day of the ablation.
PT-INR 2.48

Despite the same dose of warfarin, PT-INR was increased (2.05 to 2.48).

Results 1

1) Perioperative period

<table>
<thead>
<tr>
<th>Average ACT</th>
<th>Average heparin dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>32714 sec</td>
<td>7298±1688 U</td>
</tr>
</tbody>
</table>

2) Major Complication

<table>
<thead>
<tr>
<th>TIA (double vision)</th>
<th>Cardiac tamponade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (1%)</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>

Cerebral infarction never occurred, and incident rate of other complications were generally the same as worldwide survey.

Table: Postoperative period

<table>
<thead>
<tr>
<th>Postoperative PT-INR</th>
<th>Post ablation heparin dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT-INR &lt; 1.5</td>
<td>10,000 U/day</td>
</tr>
<tr>
<td>1.5&lt;PT-INR&lt;2.0</td>
<td>15,000 U/day</td>
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<td>2.0&lt;PT-INR&lt;2.5</td>
<td>10,000 U/day</td>
</tr>
<tr>
<td>2.5&lt;PT-INR&lt;3.0</td>
<td>5,000 U/day</td>
</tr>
</tbody>
</table>

Results 2

Heparin dose: Average 8000 ± 2214 U

PT-INR: 0.38 (P<0.001)

Results 3

The patients of higher preoperative PT-INR needed significant lower heparin dose during the procedure.

PT-INR: 2.04 ± 2.23

The PT-INR increased significantly the day after the procedure.

New Findings in Anticoagulation Management

◆ The patients who had higher preoperative PT-INRs needed lower heparin doses during the procedure.

Summary

◆ Cerebral infarction never occurred in this study, and bleeding complications occurred in the same incidence rate as previously reported in the worldwide survey.

◆ Ablation was performed safely by an administration of the adjusted dose of heparin corresponding to the preoperative PT-INR.

Conclusion

◆ AF ablation without cessation of warfarin could be performed safely, and might prevent thromboembolic complications.

◆ However, the PT-INR should be checked the day after the procedure because in many cases the level of PT-INR have been increased despite continuing the same dose of warfarin.
Anticoagulation Management without Cessation of Warfarin in the Periprocedural Period during Atrial Fibrillation Ablation

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Background

◆ Warfarin is often discontinued before atrial fibrillation (AF) ablation procedure, and intravenous heparin is used to 'bridge' the patients instead. However, this 'bridging therapy' may lead to the increasing risk of the thromboembolism and the bleeding.

◆ Though some papers about the AF ablation without stopping warfarin are published recently, appreciate heparin dose in its method is still uncertain.

Method of Anticoagulation

1) Preperative period

◆ Taking the same dose of warfarin orally.

◆ Intravenous heparin was given every hour to keep the activated clotting time (ACT) over 300 seconds during the procedure.

Additive preoperative PT-INR

Preoperative PT-INR Post ablation heparin dose
PT-INR < 1.6 20,000 U/day
1.6 ≤ PT-INR < 2.0 15,000 U/day
2.0 ≤ PT-INR < 2.5 10,000 U/day
2.5 ≤ PT-INR 5,000 U/day

Results 1

Average ACT: 327 ± 47 seconds
Average heparin dose: 7298 ± 1688 U

2) 2 Major Clotting

◆ TIA (double vision)

≤ 1 (1%)
≤ 1 (1%

Cardiac tamponade

Cerebral Infarction never occurred, and Incidet rate of other complications were generally as worldwide survey.

Summary

◆ Cerebral infarction never occurred in this study, and BLEEDING complications occurred in the same incidence rate as previously reported in the worldwide survey.

◆ Ablation was performed safely by an administration of the adjusted dose of heparin corresponding to the preoperative PT-INR.

New Findings in Anticoagulation Management

Interaction between the heparin and the warfarin are suspected as the reason.

Conclusion

◆ AF ablation without cessation of warfarin could be performed safely, and might prevent thromboembolic complications.

◆ However, the PT-INR should be checked the day after the procedure because in many cases, the level of PT-INR are increased, and might increase the risk of the thromboembolism.

N=100

- Representative Case -

63 y.o. Male Persistent

PT-INR 2.06

Purpose

◆ To investigate the appropriate heparin dose for AF ablation without stopping warfarin and confirm the safety of the method.

Study Population

◆ In the patients who underwent AF ablation without cessation of warfarin, consecutive 100 patients with PT-INR over 1.5 were prospectively enrolled in this study.

<table>
<thead>
<tr>
<th>N=100</th>
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<tbody>
<tr>
<td>Age y.o. 62 ± 19</td>
</tr>
<tr>
<td>Female 22 (22%)</td>
</tr>
<tr>
<td>Paroxsimal af 54 (54%)</td>
</tr>
<tr>
<td>Left atrium 43 ± 7</td>
</tr>
<tr>
<td>PT-INR 2.0 ± 0.4</td>
</tr>
</tbody>
</table>

Results 2

R=0.38 (P<0.001)

PT-INR

Heparin dose

The patients of higher preoperative PT-INR needed significant lower heparin dose during the procedure.

Results 3

P<0.01

PT-INR

Before procedure The following day of the procedure

The PT-INR increased significantly the day after the procedure.
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- Warfarin is often discontinued before atrial fibrillation (AF) ablation procedure, and intravenous heparin is used to 'bridge' the patients instead. However, this 'bridging therapy' may lead to the increasing risk of the thromboembolism and the bleeding.
- Though some papers about the AF ablation without stopping warfarin are published recently, appreciate heparin dose in its method is still uncertain.

Method of Anticoagulation

- Preoperative period
  - Taking the same dose of warfarin orally.
  - Intravenous heparin was given every hour to keep the activated clotting time (ACT) over 300 seconds during the procedure.

- Perioperative period
  - Adding preoperative PT-INR
    - Preoperative PT-INR: Post ablation heparin dose
      - INR<1.6: 10,000 U/day
      - 1.6<INR<2.0: 15,000 U/day
      - INR>2.0: 20,000 U/day
  - Additional heparin was given according to the preoperative PT-INR.
    - PT-INR 2.65: 5,000 U/day

The same dose of warfarin was continued throughout the AF ablation.

Results 1

1) Preoperative period
   - Average ACT: 327 ± 47 seconds
   - Average heparin dose: 7,298 ± 1,688 U

2) Major Complication
   - TIA (double vision): 1 (1%)
   - Cardiac tamponade: 1 (1%)

Cerebral infarction never occurred, and incident rate of other complications were generally the same as worldwide survey.

Results 2

- Heparin dose
  - R=0.38 (P<0.001)
  - The patients of higher preoperative PT-INR needed significant lower heparin dose during the procedure.

Results 3

- The PT-INR increased significantly the day after the procedure.

Summary

- Cerebral infarction never occurred in this study, and bleeding complications occurred in the same incidence rate as previously reported in the worldwide survey.
- Ablation was performed safely by an administration of the adjusted dose of heparin corresponding to the preoperative PT-INR.

New Findings in Anticoagulation Management

1) The patients who had higher preoperative PT-INRs needed lower heparin doses during the procedure.
2) The serum PT-INR level increases the day after the procedure.

Interaction between the heparin and the warfarin are suspected as the reason.

Conclusion

- AF ablation without cessation of warfarin could be performed safely, and might prevent thromboembolic complications.
- However, the PT-INR should be checked the day after the procedure because in many cases, the level of PT-INR have been decreased despite continuing the same dose of warfarin.

Study Population

- In the patients who underwent AF ablation without cessation of warfarin, consecutive 150 patients with PT-INR over 1.5 were prospectively enrolled in this study.

| N=150 | Age y.o. 62±9 | Female 21 | Paroxysmal 64 | Left atrium 43±7 | PT-INR 2.0±0.4 |

Additional Information:

- Anticoagulation Management without Cessation of Warfarin in the Periprocedural Period during Atrial Fibrillation Ablation

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