Klatskin tumors
Endoscopic Diagnosis and Therapy

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Klatskin: Requirements for ERCP

Preoperative Management

Diagnosis incl. Tissue Staging Preoperative Drainage

Palliative Management

Stenting/Drainage/PTCD Alternatives
Klatskin: Preoperative Diagnostics

Basics

Conservative Approach

> Bismuth II only palliation

Aggressive Surgical Approach

(Extended) right lobe resection
Enlargement of left lobe if necessary
No metastases
Klatskin: Preoperative Diagnostics

Basics

I

II

IIIA

IIIB

IV
Klatskin: Preoperative Diagnostics

Basics

II

IIIA

IIIB

IV
Klatskin: Preoperative Diagnostics

Conservative approach

I

II

IIIA

IIIB

IVA

IV
Klatskin: Preoperative Diagnostics

Aggressive approach

III

III

IIIA

IIIB

IV
Klatskin: Preoperative Diagnostics

Basics

IV
Klatskin: Preoperative Diagnostics

Basics

IV
Klatskin: Preoperative Diagnostics
Klatskin: Preoperative Diagnostics

Basics

- S7/8
- S5/6
- S4A
- S2/3
- IV
Klatskin: Preoperative Diagnostics

Basics

S5/6

S7/8

S4A

S2/3

IV
Klatskin: Preoperative Diagnostics

Basics

S7/8
S5/6
S4A
S2/3
IV
Klatskin: Preoperative Diagnostics

Basics

S7/8  S5/6  S4A  S2/3

IV
Klatskin: Preoperative Diagnostics

CT

Tumor extent
Metastases

Volumetry
left side

IV

S7/8
S5/6
S4A
S2/3
Klatskin: Preoperative ERCP

What do we want to know?

Longitudinal spread

How?

As accurately as possible
As non-invasively as possible
Klatskin: ERCP Dilemma

Most accurate bile duct visualization - but

Technically demanding
Filling of all ducts requires multiple drainages and increases infection risk
Not always possible

Tissue diagnosis possible - but

Accuracy limited
Influence on further management ?
Klatskin: Biliary Visualization

Visualization

Only right side
Klatskin: Biliary Visualization

Visualization

Only right side

Double balloon technique
Visualization
Only right side
Double balloon technique

Klatskin: Biliary Visualization
### Klatskin: Tissue Diagnosis

**Brush cytology**

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Cholangiocarcinoma</th>
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</thead>
<tbody>
<tr>
<td>Wiersema</td>
<td>1992</td>
<td>64% (7/11)</td>
</tr>
<tr>
<td>Ponchon</td>
<td>1995</td>
<td>44% (12/25)</td>
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<tr>
<td>Pugliese</td>
<td>1995</td>
<td>73% (16/22)</td>
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<tr>
<td>Sugiyama</td>
<td>1996</td>
<td>59% (10/17)</td>
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<tr>
<td>Mansfield</td>
<td>1997</td>
<td>63% (10/16)</td>
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<tr>
<td>Glasbrenner</td>
<td>1999</td>
<td>80% (16/20)</td>
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<tr>
<td>Vandervoort</td>
<td>1999</td>
<td>60% (6/10)</td>
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<tr>
<td>Macken</td>
<td>2000</td>
<td>60% (18/30)</td>
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<tr>
<td>Farrell</td>
<td>2001</td>
<td>50% (2/4)</td>
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<td><strong>Total</strong></td>
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<td><strong>62% (97/155)</strong></td>
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## Klatskin: Tissue Diagnosis

### Forceps biopsy

<table>
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<tr>
<th>Author</th>
<th>Year</th>
<th>Cholangiocarcinoma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wiersema$^{39}$</td>
<td>1992</td>
<td>86% (6/7)</td>
</tr>
<tr>
<td>Kubota$^{43}$</td>
<td>1993</td>
<td>89% (16/18)</td>
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<tr>
<td>Ponchon$^{8}$</td>
<td>1995</td>
<td>44% (7/16)</td>
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<tr>
<td>Pugliese$^{9}$</td>
<td>1995</td>
<td>60% (6/10)</td>
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<tr>
<td>Sugiyama$^{37}$</td>
<td>1996</td>
<td>88% (15/17)</td>
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<tr>
<td>Jailwala$^{5}$</td>
<td>1999</td>
<td>37% (17/46)</td>
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<tr>
<td><strong>Total</strong></td>
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<td><strong>59% (67/114)</strong></td>
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Klatskin: Tissue Diagnosis

New devices?
Clinical Relevance?

Does negative tissue diagnosis prevent surgery?

„Soft facts“

PSC surveillance (?)
Klatskin: Initial Don’t Do’s

- ERCP without suspicion of hilar problem
- Filling of all ducts
- One small drainage only (right medial)
- Excessive tissue diagnosis

Interdisciplinary concept
Therapy in centers
Klatskin: Initial To Do’s

Ultrasound should raise suspicion

MRCP and CT

Interdisciplinary decision on management

If surgery

- Size of contralateral side (enlargement)
- Preoperative drainage of contralateral side

ERCP only for targeted drainage or palliation

Tissue diagnosis not required in typical cases
Klatskin: Preoperative Drainage

ERCP and stent

PTCD peripheral
Klatskin: Requirements for ERCP

Preoperative Management

Diagnosis incl. Tissue Staging Preoperative Drainage

Palliative Management

Stenting/Drainage/PTCD Alternatives
Drainage unilateral oder bilateral?

Undetermined
Depends on contrast injection
Probably mostly sufficient unilaterally
Metal stents?
Klatskin: MR-Guided Drainage

N=35, stenting only into most dilated side

19 left, 16 right

Bilirubin decrease from 18.9 mg% to 3.2 mg%

*Hintze R et al. Gastrointest Endosc 2001*
Klatskin: Preoperative Drainage
Figure 2. Kaplan–Meier survival curve of randomized patients treated with PDT plus stenting (group A, n = 20) and of patients with stenting alone (group B, n = 19). Survival was longer in group A compared with group B (P < 0.0001). +, Patients still alive.
## Klatskin: Management Suggestions

### Preoperative Management

<table>
<thead>
<tr>
<th>Diagnosis incl. tissue</th>
<th>mostly not required</th>
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<tbody>
<tr>
<td>Staging</td>
<td>MRCP, CT (ERCP)</td>
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<tr>
<td>Preoperative drainage</td>
<td>ERCP/PTCD</td>
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<tr>
<td>Experimental approaches</td>
<td>neoadjuvant PDT</td>
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### Palliative Management

<table>
<thead>
<tr>
<th>Stenting/drainage</th>
<th>ERCP, then PTCD</th>
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<tbody>
<tr>
<td>Alternatives</td>
<td>start unilaterally</td>
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<tr>
<td></td>
<td>PDT ? Afterloading</td>
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