Does MRI enhance the detection rate of Morton’s neuroma in daily practice?

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Background

- Morton’s neuroma is primarily a clinical diagnosis.

- The differentiation from other forefoot pathologies like metatarsalgia and rupture of the plantar plate of MTP joints can be difficult.\(^{(1)}\)

- Some authors recommend an MRI to confirm clinical diagnosis and to exclude accompanying diseases.\(^{(2)}\)

- MRI had high sensitivity and specificity under study conditions.\(^{(3)}\)

- Using prone position and contrast medium enhances the accuracy of MRI.\(^{(4)}\)

- The purpose of this study was to evaluate the accuracy of routine MRI compared to clinical and histological findings.
Material and methods

► Retrospective study

► Inclusion criteria:
  ▪ All consecutive patients receiving an excision of a Morton’s neuroma
  ▪ period January 2007 and August 2013
  ▪ availability of
    • clinical examination
    • MRI
    • results of histological examination

► Exclusion criteria: Patients under 18 years
Results

► 71 patients could be included.
► 58 patients were female, 13 patients were male.
► The mean age was 57 (range, 38 – 92) years.
► 63 MRI were performed with contrast medium (89%).
► 57 MRI were conducted in prone position (80%).
► In 22 patients MRI showed additional forefoot pathologies (e.g. MTP-I arthritis, tenovaginitis).
Results

► Clinical symptoms

■ 65 cases (92%) with stabbing and neuralgic plantar pain and dysesthesia

■ 63 cases (89%) with increased pain on walking

■ 50 cases (69%) with decreased pain at rest

► In six cases the clinically symptoms could not be differentiated from other forefoot pathologies

■ in five of these patients MRI supported the decision for operative treatment
Results

► Histological examination verified a Morton’s neuroma in 68 cases (96%)
  ■ In two cases histological examination showed an inflammatory bursitis
  ■ In one case histological result was consistent with a granuloma
  ■ All three patients had pain relief after excision of the pathology
  ■ In two of these cases MRI indicated misleadingly a Morton’s neuroma

► MRI detected a Morton’s neuroma in 59 cases, therefrom it was false positive in two cases

► In eleven cases MRI was false negative
  ▪ In 4/11 (36%) false negative MRI no contrast medium was used.
  ▪ In 4/11 (36%) false negative MRI the patient was placed in supine position.
# Results

<table>
<thead>
<tr>
<th></th>
<th>MRI</th>
<th>Clinical symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensitivity</strong></td>
<td>0.84</td>
<td>0.94</td>
</tr>
<tr>
<td><strong>Specificity</strong></td>
<td>0.33</td>
<td>0.33</td>
</tr>
<tr>
<td><strong>Positive predictive value</strong></td>
<td>0.97</td>
<td>0.97</td>
</tr>
<tr>
<td><strong>Negative predictive value</strong></td>
<td>0.08</td>
<td>0.20</td>
</tr>
</tbody>
</table>

**Diagrams:**

- **MRI:**
  - Positive MRI: 60 patients
  - Negative MRI: 10 patients

- **Clinical symptoms:**
  - Positive main symptoms: 80 patients
  - Negative main symptoms: 5 patients
Conclusions

- Clinical symptoms had a higher sensitivity and negative predictive value than MRI under routine conditions.

- We could confirm the importance of using contrast medium and prone position to improve the detection rate of a Morton’s neuroma.

- MRI can help to secure the diagnosis in difficult cases and exclude other pathologies.

- When using a MRI a specific tentative diagnosis should be given to allow the radiologist to use the optimal settings, which may differ from machine to machine.

- In the background of increasing medical costs, this expensive and time-consuming procedure should be indicated and interpreted carefully.
References:


Authors: