Correlation between preoperative CT measurement/evaluation of lumbar paraspinous muscle and postoperative ambulatory status in patients with femoral neck fractures

Akihito Suto, Kengo Fujii, Takushi Nakatani, Kaishi Ogawa, Takumi Ichihara, Sayori Li

Department of Orthopaedic Surgery
Showa General Hospital, Tokyo, Japan
Disclosures

The authors have no COI to disclose.
Purpose of this study: to evaluate the relationship between the paraspinous/psoas muscles evaluation and the postoperative ambulatory status in patients with femoral neck fractures.
**Method**

92 patients who underwent bipolar hip arthroplasty (Sep 2017-Mar 2020). 55 out of 92 patients were followed up more than 30 days after discharge.

Ambulatory status was classified into 6 levels as follows:

1; independently walk on surface
2; walk with crutches without assistance
3; use of regular front or reverse walker
4; need continuous support from one person
5; wheelchair
6; bedridden  

(Abe et al, Arch Osteoporos 2018)

Assessed at
- before injury,
- 1, 2 weeks after surgery,
- discharge,
- final follow-up.

The cross-sectional area of paraspinous and psoas muscles at an axial slice of superior end of L5 vertebra

The degeneration of the muscles were evaluated according to the Goutallier classification  

(Goutallier, Clin Orthop Relat Res 1994)
### Result: relationship (Ambulatory status-CT)

<table>
<thead>
<tr>
<th>Ambulatory Status</th>
<th>CT scan</th>
<th>Psoas muscle</th>
<th>Paraspinoous muscle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
<td>p</td>
<td>r value</td>
</tr>
<tr>
<td>before injury</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSA</td>
<td>0.01</td>
<td>0.95</td>
<td>0.22*</td>
</tr>
<tr>
<td>Goutallier</td>
<td>0.02</td>
<td>0.83</td>
<td>0.04</td>
</tr>
<tr>
<td>1 week - discharge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSA</td>
<td>0.14</td>
<td>0.20</td>
<td>0.22*</td>
</tr>
<tr>
<td>Goutallier</td>
<td>0.01</td>
<td>0.96</td>
<td>0.12</td>
</tr>
<tr>
<td>final follow-up (n=55)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CSA</td>
<td>0.04</td>
<td>0.76</td>
<td>0.29*</td>
</tr>
<tr>
<td>Goutallier</td>
<td>0.16</td>
<td>0.24</td>
<td>0.086</td>
</tr>
</tbody>
</table>

CSA: cross sectional area

*: r > 0.2  **: p < 0.05

Pearson correlation coefficient was used for statistical analysis

p < 0.05 was considered significant
Result; relationship (Ambulatory status-CT)

(r)

Psoas muscle

Paraspinous muscle

before injury (n=92)

1 week-discharge

final follow up (n=55)
CSA of the paraspinous muscle could be useful for identifying sarcopenia. (①)

CSA of the paraspinous muscle was significantly correlated with both the improvement and the final ambulatory status after bipolar hip arthroplasty. (②③)
Conclusion

The measurement/evaluation of cross-sectional area of the paraspinous muscle using preoperative CT might be useful for predicting improvement and final ambulatory status after bipolar hip arthroplasty.