Effect of Ortho-Geriatric Co-Management on Hip Fractures

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Purpose

To report

- How we introduced multidisciplinary treatment approach for geriatric hip fractures
- The effect of the multidisciplinary treatment approach
Toyama Municipal Hospital (539 beds)
6 Orthop. Surgeons, 1000 surgeries/year

Approximately 140 Geriatric hip fractures / year
Geriatric patients with comorbidity happen to have hip fracture. They should be treated not only by the Orthop. dept. but by the hospital as a whole.
Steps

1. Understand the present situation of our hospital.

2. Let the other discipline to understand the needs and the benefits of multidisciplinary approach.

3. Work together, never force them.

4. Show the improvement.
Steps

1. Understand the present situation of our hospital.
2. Let the other discipline to understand the needs and benefits of multidisciplinary approach.
3. Work together, never force them.
4. Show the improvement.

Evaluate the status
Cases in 2012

Surgically treated trochanteric and neck fractures (> 65 yrs.)

105 cases

<table>
<thead>
<tr>
<th>Gender</th>
<th>male 18</th>
<th>female 87</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>65 ~ 100 yrs. (Avg. 84.0 yrs.)</td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Trochanteric 65, Neck 40</td>
<td></td>
</tr>
<tr>
<td>Procedure</td>
<td>ORIF 73, Endoporsthesis 32</td>
<td></td>
</tr>
</tbody>
</table>
Evaluation

- Timing: admission to surgery
- Duration of hospital stay
- Postop. complications
- Consultation with other department
  - Preop. and Postop. Internal medicine consultation
  - Psychiatry consultation
- Osteoporosis treatment
Timing: admission to surgery

Avg. 1.4±1.9 days (0 - 12 days)
* 80% were operated within 48 hours

Japan national avg. 4.6 days (2012)
Hospital stay

Avg. 17.2±5.8 days (8 - 35 days)

Japan national avg. 37.7 days (2012)
Postop. complications

25 case／105 cases (23.8%)

1. Delirium 8 cases
2. UTI 4 cases
3. Pneumonia 3 cases
4. PE(Non symptomatic) 2 cases
5. Heart failure 2 cases
6. Pressure ulcer 2 cases
7. Others 5 cases
Other department consultation

Internal medicine

Preop.

Postop.

2% (Complication)

Yes

No

85%

15%

70%

30%
Other department consultation

Psychiatry

4 cases / 105 cases (3.8%)

- Delirium 1 case
- Pre-injury disease 3 cases
Osteoporosis treatment

Low rate of antiosteoporosis treatment
Clear Problems

1. Geriatric patients have several diseases
   Preop. Internal medicine consultation is mandatory
   But not 100% patients consulted preoperatively

2. Postop. Psychiatric problems were common
   Needs closer relation with Psychiatry

3. Insufficient secondary fracture prevention
   Cooperate with ward pharmacist
2. Let the other discipline to understand the needs and the benefits of multidisciplinary approach.

【AO Geriatric course】

Sent Internist, Anesthesiologist, Psychiatrist to the course

【Lectures in the hospital】

By Prof. Michael Blauth
Steps

How to get the cooperation from others discipline?

3. Work together, never force them.
Team Meeting

Detailed discussion

1. Who contact the internist first?
2. When to refer to the subspecialty of internal medicine?
3. Who order to stop the anticoagulant therapy?
4. Who prescribe heparin bridge?
5. Who write the reply letter to the former doctor?
6. Who order the internal subspecialty consult? etc.
Hospital guideline

- Organizational construction
- Preoperative assessment
- Timing of operation
- Antibiotic treatment
- Anti-thromboembolic treatment
- Pain therapy
- Workflow in case of preexisting anticoagulation therapy
- Prevention and treatment of delirium
- Osteoporosis diagnosis and treatment
- Nutrition management
Improvement

1. Safe & smooth early surgery
   - Examination by internist on admission
   - United chart
     ⇒ Avoid repeated interview
     ⇒ No referral letter

2. Reduce perioperative psychiatric complications
   - Prevention and early treatment of delirium

3. Secondary fracture prevention
   - Check the antiosteoporosis medication by ward pharmacist
   - Patients and family education by diatitian about osteoporosis and antiosteoporosis diet
Each department manual

**ER department**

Emergency transport
↓
Doctor use a clinical pass
↓
Check (blood flow of lower limbs, neurological symptom of lower limbs)
Keep safe position of lower limbs
↓
X-ray examination
  (chest, cross-table lateral view 2R)
↓
Fracture p/o
  ➡a blood test, intravasucular indwelling catheter, electrocardiogram, urine test, a bladder indwelling balloon catheter
↓
Medical examination
  by orthop.surgeon and by internist
↓
Preparation of a bed
↓
Patient from geriatric health services facility or another hospital
  ➡culture test of sputum & urine
↓
Informed consent
↓
Medical examination by Anesthesiologist
↓
Moving a patient to operation room or orthopedic ward

This manual established the care system in ER not affected by experience of medical staffs.
### Internal medicine subspecialty consult criteria

<table>
<thead>
<tr>
<th>Cardiovascular</th>
<th>Endocrinology</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;70 yr. with history CVD</td>
<td>BS: &gt;200mg/dl or DM</td>
</tr>
<tr>
<td>&gt;80 yr.</td>
<td>⇒ check HbA1c, BS 3 times/day etc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nephrology</th>
<th>Pulmonology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with dialysis</td>
<td>Asthma, SpO2≤90</td>
</tr>
<tr>
<td>Chronic renal disease: Cr&gt;2</td>
<td></td>
</tr>
</tbody>
</table>
Improvement of the system repeatedly
# Cases in 2014

Surgically treated trochanteric and neck fractures (> 65 yrs.)

133 cases

<table>
<thead>
<tr>
<th>Gender</th>
<th>male 24</th>
<th>female 109</th>
</tr>
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<tbody>
<tr>
<td>Age</td>
<td>65〜 100 yrs. (Avg. 84.8 yrs.)</td>
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<tr>
<td>Location</td>
<td>Trochanteric 88, Neck 45</td>
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<tr>
<td>Procedure</td>
<td>ORIF 102, Endoprosthesis 31</td>
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</tbody>
</table>
Timing: admission to surgery

105 cases in 2012

Avg. 1.4 ± 1.9 days (0 - 12 days)

36% (38 cases)
35% (37 cases)
7% 7%
9% 1% 1% 1%

133 cases in 2014

Avg. 1.3 ± 1.7 days (0 - 11 days)

31% (41 cases)
37% (49 cases)
14% 5%
9% 1% 1% 1%

■ day of admission
■ 1 day
■ 2 days
■ 3 days
■ 4 days
■ 5 days
■ 6 days
■ 7 days
■ 10 days
■ 11 days
■ 12 days

105 cases in 2012:
- 36% (38 cases) on the day of admission
- 35% (37 cases) 1 day later
- 9% 7% 1% 1% on days 2 to 5

133 cases in 2014:
- 31% (41 cases) on the day of admission
- 37% (49 cases) 1 day later
- 14% 5% 1% 1% on days 2 to 5
Hospital stay

 Avg. 17.2 days (8 – 35 days) 2012

 Avg. 18.4 days (8 – 36 days) 2014
## Postop. complications

<table>
<thead>
<tr>
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<th>2012</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25 / 105 cases (23.8%)</td>
<td>50 / 133 cases (37.6%)</td>
</tr>
<tr>
<td>Delirium</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>UTI</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>PE</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Heart failure</td>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td>Pressure ulcer</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>DVT</td>
<td>—</td>
<td>23 (Non-symptomatic)</td>
</tr>
<tr>
<td>Urinary Retention</td>
<td>—</td>
<td>12</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
Positive effect of multidisciplinary approach

- Duration of stay in ER
- Osteoporosis treatment
- Medical cost
Stay in ER

* shortened by 43 minutes on average

!(min)

Avg. 3hr 11min

2013

Avg. 2hr 28min

2014
High rate of antiosteoporosis treatment (39%⇒ 95%)
Medical cost

The neighbor acute phase hospitals  6 hospitals
Diagnosis Procedure Combination hospitals  371 hospitals

- The average daily medical costs per patient
- The average total hospitalization medical costs per patient
The average daily medical costs per patient

<table>
<thead>
<tr>
<th></th>
<th>Our hospital</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Whole country Avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(thousand yen)</td>
<td>63.1</td>
<td>57.9</td>
<td>45.5</td>
<td>44</td>
<td>46.8</td>
<td>43.8</td>
<td>55.1</td>
</tr>
</tbody>
</table>

32% higher than the neighbor hospitals average (47,640 yen)
14% higher than national average (55,141 yen)

the high profit efficiency to the hospital
The total hospitalization medical costs per patient

26% lower than the neighbor hospitals average (1,656,624 yen)
25% lower than national average (1,656,624 yen)

the low total medical cost
Discussion
Ortho-Geriatric comanagement

Models of orthogeriatric care
- Orthogeriatric liaison model of care
- Post-operative geriatric rehabilitation unit
- Joint model of care

Geriatrician is essential.

Effect of orthogeriatric care
- Reduced time to surgery
- Reduced complication rates
- Reduced readmission rates
- Reduced inpatient mortality rates
- Reduced long-term mortality rates
- Reduced length of stay
- Reduced costs

Leung AH, et al. (2011) J Trauma
Geriatrician is few in Japan

Closer collaboration with internal medicine and all other departments related to hip fracture treatment

Possible style that will be accepted in Japan
Conclusion

- We have introduced multidisciplinary treatment approach for geriatric hip fractures in our hospital.

- Multidisciplinary treatment has no influence on time to surgery, postoperative complications and hospital stay length.

- Osteoporosis treatment have been greatly improved.

- The multidisciplinary approach produced the high profit efficiency to the hospital, and the total medical costs have been reduced.