Toronto — For patients with acute cholecystitis, CT is not yet accurate enough to go straight from a scan to a treatment plan, new research shows.

"My personal hypothesis was that CT was going to be the be all and end all — that if the scan was positive, the patient could be treated directly," said Helena Gabriel, MD, from the Northwestern University Feinberg School of Medicine in Chicago. "What we found instead is that the positive-predictive value and the sensitivity of CT are not high enough to do that," she told Medscape Medical News.

"We also found false positives on the CT scans that we were not expecting," she pointed out here at the American Roentgen Ray Society 2015 Annual Meeting.

Current guidelines recommend that patients with suspected acute cholecystitis be evaluated first with ultrasound; "however, in the emergency department, patients are often first evaluated with CT," Dr Gabriel explained.

The retrospective study involved 446 patients who presented to the emergency department with suspected acute cholecystitis. All had undergone CT scanning and ultrasound examination within 24 hours of each other.

For 121 of these patients, CT results indicated suspicious or possible cholecystitis. In fact, 72 had cholecystitis and 49 did not.

The negative-predictive value was high for both CT and ultrasound.

There was 85% agreement between CT and ultrasound findings; however, for 68 scans, results were discordant, Dr Gabriel reported. "When findings from CT and ultrasound are discordant, it is entirely unhelpful and the diagnosis is called in question," she said.

Table. Accuracy of the Imaging Techniques

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>CT, %</th>
<th>Ultrasound, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>72.0</td>
<td>75.0</td>
</tr>
<tr>
<td>Specificity</td>
<td>85.9</td>
<td>90.8</td>
</tr>
<tr>
<td>Positive-predictive</td>
<td>59.5</td>
<td>70.1</td>
</tr>
<tr>
<td>Negative-predictive</td>
<td>91.4</td>
<td>92.6</td>
</tr>
</tbody>
</table>

When CT and ultrasound results were both positive, the positive-predictive value did increase slightly.
but not significantly so.

For the small subgroup of patients with positive CT results and negative ultrasound results, the ultrasound was correct half the time and the CT was correct half, "so it was a flip of the coin," said Dr Gabriel.

In the 70 patients with highly suspicious CT scans, acute cholecystitis was present in 54 patients, yielding a positive-predictive value of 77% in this particular subset.

In contrast, "we did have false positives with CT," Dr Gabriel reported, many related to the presence of other biliary processes or multiple medical conditions.

"Emergency departments are very busy places, and sometimes it's hard to specify where the pain's coming from. As a general "look-and-see," CT is often done first," Dr Gabriel said.

However, on the basis of these data, "I will probably be recommending ultrasound after CT, although if the CT is completely negative, I won't necessarily use ultrasound to evaluate the patient for cholecystitis alone because of the very high negative-predictive value of CT," she explained.

"If the CT is positive, I will probably want to look at that patient with ultrasound as well, just to improve the sensitivity of the diagnosis and because false positives can occur with CT," she added.

This study confirms that ultrasound has a better sensitivity than CT, and that it should be used in the first-line evaluation of suspected acute cholecystitis, said session cochair Ramit Lamba, MD, from the University of California at Davis.

However, in most emergency departments, "when they have a patient with nonspecific right upper quadrant pain, they end up ordering a CT," he told Medscape Medical News.

The advantage doing a CT first is that it allows physicians to pick up alternative diagnoses, which is not always possible with ultrasound, Dr Lamba pointed out.

"If a patient has something other than acute cholecystitis, then a CT would be of value. This is where the emergency department feels there is an advantage in ordering CT studies first," he explained.

"Dr Gabriel and Dr Lamba have disclosed no relevant financial relationships."