



:
 :
 : CT 80
 : 80 23 (28.7%) 가
 17 (73.5%), 7 (30.4%), 5
 (21.7%), 5 (21.7%), 가 1
 (4.3%) 가 8
 (34.7%) 6 , 3 ,
 3 , 2
 : 30% 가
 CT 가 가
 가
 , 가 CT 가
 (1). CT 1994 9 1998 2 CT
 80
 가 46 , 가 34 5.7 ,
 2 14 CT High Speed
 Advantage CT Scanner (GE Medical System. Milwaukee,
 Wisconsin, U.S.A.) , 1
 (2)가 , 가 , , ,
 CT
 (3) (subphrenic space),
 (Morison's pouch), (perisplenic space),
 (paracolic gutter), (pouch of
 Douglas), (pelvic space) (mesentery)
 10 mm
 CT 3 (cut) 가
 grade 1, 4 - 5 grade 2, 6
 grade 3

grade 1 가 , grade 2
가 , grade 1
가 , grade 3
grade 2 가

80

, 57
23 8 (35%)

23 (28.7%)
가

23 13 , 4 ,
6 57 26 , 9 ,
22 , 80 39
13 , 13 4 , 28 6

23 22

17 (73.5%) (Fig. 1),
5 (21.7%) (Fig. 2),
가 1

가 7 (30%) (Fig. 3), 1
5 (Fig. 4).

가 57
16 (28%)
14 (24%),
3 (5.2%)

3 (5.2%),

가 가 8

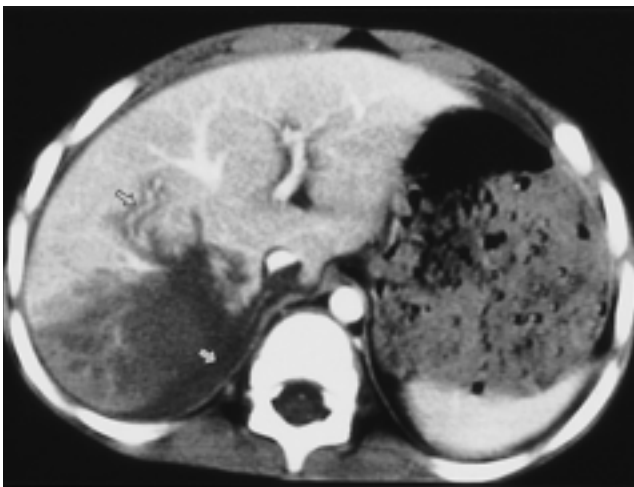
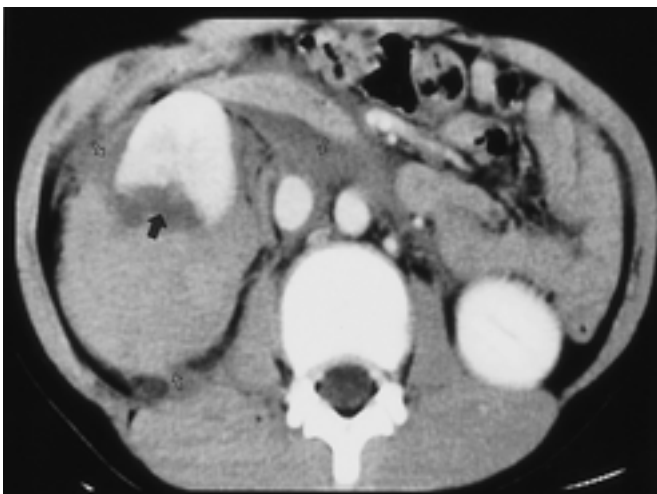


Fig. 1. A 5-year-old male patient with hepatic injury. There are laceration and contusion in the right lobe of liver, associated with fluid collection in the bare area (white arrow). Periportal tracking is seen (open arrow).

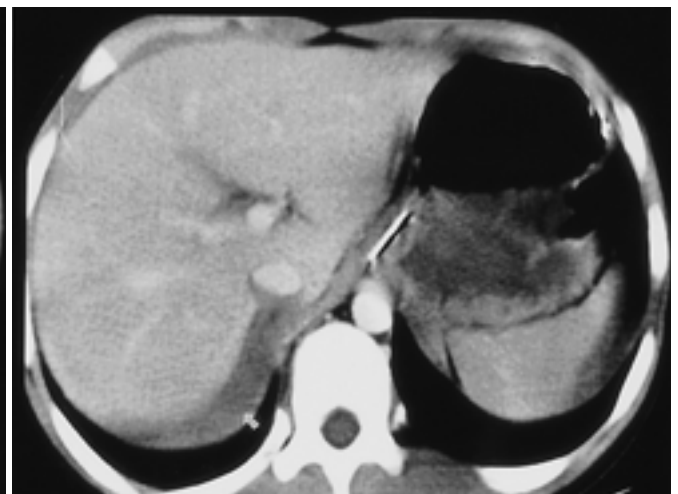


A

Fig. 2. A 9-year-old male patient with major renal injury .

A. Contrast enhanced CT scan shows a fracture of the lower pole of the right kidney (arrow). Extensive hematoma in the perirenal and anterior pararenal spaces (open arrows) are noted.

B. Fluid collection is seen in the bare area (white arrow), but there was no evidence of liver injury.



B

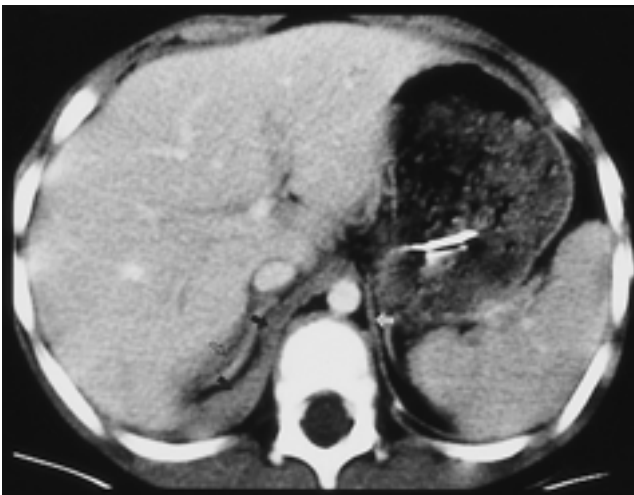


Fig. 3. A 5-year-old boy with diaphragmatic contusion. As compared with the left hemidiaphragm (white arrow), the right hemidiaphragm (arrows) is thickened. This finding indicates diaphragmatic contusion. Small amount of fluid collection is present in the bare area (open arrow).

6 (73.5%), 3 (37.5%),
3 (37.5%), 2 (25%)

(coronary ligament)

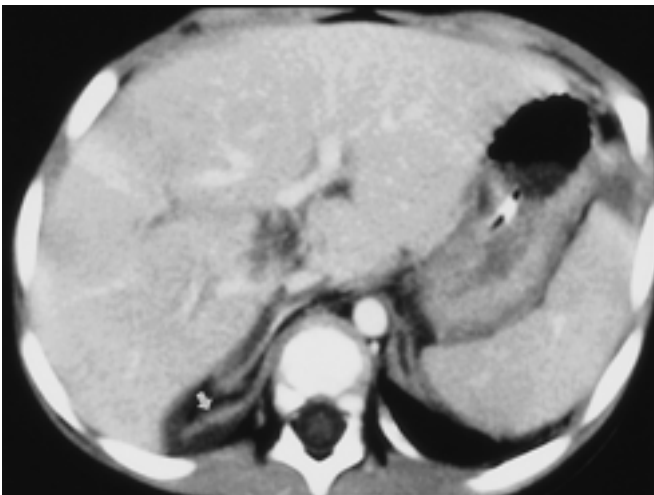
(triangular ligament)

(falciform ligament)

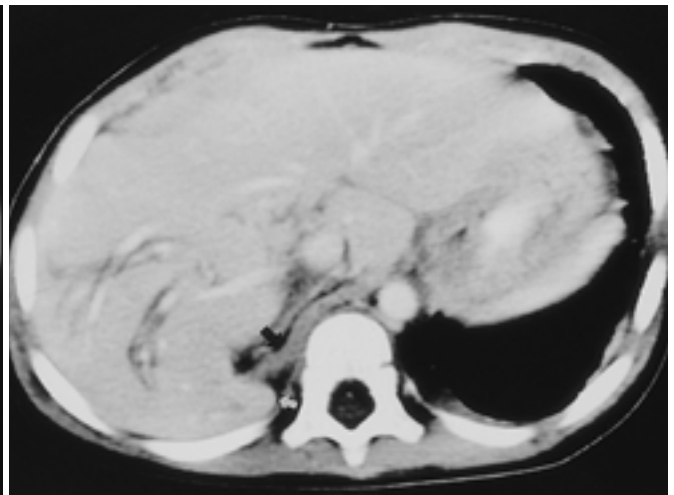
(lesser omentum) Gerota (Gerota's
fascia) (4 - 6).

가 , Patten (2)
25

88%



A



B



C

Fig. 4. A 5-year-old boy with delayed diaphragmatic hernia.
A. Initial CT scan shows laceration in the right lobe and fluid collection in bare area. The right hemidiaphragm (white arrow) is thick, irregular in contour, and displaced forwardly.
B, C. Follow-up CT scans 5 days later.
B. The right hemidiaphragm is thick (arrow) and the diaphragmatic defect (white arrow) is seen.
C. The herniated liver is located in the right thoracic cavity.

:

가 (15). Shackleton (16)
10 8 24

가 33%, 30%,
21%

가 23 30.4% 가 1 5 CT
73.5% 가 24%, (strangulation)
5.2% 가 가

(17). CT 가

가 8 6
2
1 , 1
(perirenal
space) (renal fascia)
(pararenal space)
(7, 8), Mindell (9)
(perirenal space)

(infrarenal space)
(perirenal space) (pararenal space)
(10 - 12).

(perirenal space) 가
10

가
CT

(13).

Leung (14)
6 CT

4
가 CT

가

1. Ruess L, Sivit C, Eichelberger M, Gotschall C, Taylor G. Blunt abdominal trauma in children: Impact of CT on operative and nonoperative management. *AJR Am J Roentgenol* 1997;169:1011-1014
2. Patten R, Spear R, Vincent L, Hesla R, Jurkovich G. Traumatic laceration of the liver limited to the bare area: CT findings in 25 patients. *AJR Am J Roentgenol* 1993;160:1019-1022
3. Levine C, Patel U, Wachsberg R, Simmons M, Baker S, Cho KH. CT in patients with blunt abdominal trauma: Clinical significance of intraperitoneal fluid detected on a scan with otherwise normal findings. *AJR Am J Roentgenol* 1995;164:1381-1385
4. Lim JH, Auh YH, Suh SJ, Kim KW. Right perirenal space: Computed tomography evidence of communication between the bare area of the liver. *Clin Imaging* 1990;14:239-244
5. Lim JH, Auh YH. Anatomic relation between the bare area of the liver and the right perirenal space. *AJR Am J Roentgenol* 1994;162:733-734
6. Rubenstein W, Auh YH, Whalers J, Kazam E. The perihepatic spaces: Computed tomographic and ultrasound imaging. *Radiology* 1983;149:231-239
7. Meyers M, Whalen J, Peelle K, Berne A. Radiologic features of extraperitoneal effusions: An anatomic approach. *Radiology* 1972;104:249-257
8. Love L, Meyers M, Churchill R, Reynes C, Moncada R, Gibson D. Computed Tomography of extraperitoneal spaces. *AJR Am J Roentgenol* 1981;136:781-789
9. Mindell H, Mastromatteo J, Dickey K, et al. Anatomic communications between the three retroperitoneal spaces: Determination by CT- guided injections of contrast material in cadavers. *AJR Am J*

- Roentgenol* 1995;164:1173-1178
10. Lim JH, Kim BH, Auh YH. Continuation of gas from the right perirenal space into the bare area of the liver. *J Comput Assist Tomogr* 1997;21:667-670
 11. Bechtold R, Dyer R, Zagoria R, Chen M. The perirenal space: Relationship of pathologic processes to normal retroperitoneal anatomy. *Radiographics* 1996;16:841-854
 12. Mastromatteo J, Mindell H, Mastromatteo M, Magnant M, Sturtevant N, Shuman W. Communications of the pelvic extraperitoneal spaces and their relation to the abdominal extraperitoneal spaces: Helical CT cadaver study with pelvic extraperitoneal injections. *Radiology* 1997;202:523-530
 13. Murray J, Caoili E, Gruden J, Evans S, Halvorsen R, Mackersie R. Acute rupture of the diaphragm due to blunt trauma: Diagnostic sensitivity and specificity of CT. *AJR Am J Roentgenol* 1996;166:1035-1039
 14. Leung J, Nance M, Schwab C, Miller W. Thickening of the diaphragm: a new computed tomography sign of diaphragm injury. *J Thorac Imaging* 1999;14:126-129
 15. Steinau G, Bosman D, Dreuw B, Schumpelick V. Diaphragmatic injuries -classification, diagnosis and therapy. *Chirurg* 1997;68:509-512
 16. Shackleton K, Stewart E, Taylor A. Traumatic diaphragmatic injuries: Spectrum of radiographic findings. *Radiographics* 1998;18:49-59
 17. Pomerantz M, Rodgers B, Sabiston D. Traumatic diaphragmatic hernia. *Surgery* 1968;64:529-534

Localized Fluid Collection of Hepatic Bare Area in Children with Blunt Abdominal Trauma¹

Myung Gi Kim, M.D., Ji Hyung Kim, M.D., Ok Hwa Kim, M.D.,

¹Department of Diagnostic Radiology, Ajou University, School of Medicine

Purpose: To investigate the incidence and significance of localized fluid collection in the hepatic bare area resulting from blunt abdominal trauma in children.

Materials and Methods: We retrospectively reviewed the CT scans and medical records of eighty children with blunt abdominal trauma and evaluated the incidence of fluid collection in the hepatic bare area. The findings were correlated with the presence of injury to adjacent organs.

Results: Fluid collection in the hepatic bare area was noted in 23 of 80 patients (28.7%). Associated organ injuries included liver laceration (17/23), contusion of the right hemidiaphragm (7/23), right adrenal injury (5/23), and right renal injury (5/23). In one patient, organic injury was not detected in spite of fluid collection in the hepatic bare area. Eight of 23 patients (34.8%) showed fluid collection in this area, but not intraperitoneally.

Conclusion: Fluid collection in the hepatic bare area after blunt abdominal trauma was noted in about 30% of patients and was frequently accompanied by injury to adjacent organs. Since right hemidiaphragmatic contusion associated with fluid collection in the bare area was a not uncommon CT finding, close observation of the condition is warranted.

Index words : Children, injuries
Computed tomography(CT), in infants and children
Peritoneum, CT
Peritoneum, fluid

Address reprint requests to : Myung Gi Kim, M.D., Department of Diagnostic Radiology, Ajou University, School of Medicine
San 5, Wonchon-dong, Paldal-gu, Suwon 442-749, Korea.
Tel. 82-31-219-5826 Fax. 82-31-219-5862

11TH ANNUAL MEETING AND POST GRADUATE COURSE OF THE EUROPEAN SOCIETY OF GASTROINTESTINAL AND ABDOMINAL RADIOLOGY (ESGAR) (2000 6 21-24)

venue: Palais des Congres, La Gradne Motte, France.
contact: Prof. J. M. Bruel, Chef de Serv., Imagerie Med.,
Hôpital St. Eloi,
CHU de Montpellier, F-34295 Montpellier cedex 5,
France.
(tel: 33-467337119; fax: 33-467337549;
E-mail: jm-bruel@chu-montpellier.fr)

ANNUAL MEETING CLINICAL MAGNETIC RESONANCE SOCIETY (2000 6 22-25)

venue: Fairmont Hotel, San Francisco, CA, USA.
contact: Caren L. Theuring, Cl. Magn. Resoance Society,
Suite 104, 2825 Burnet Avenue, Cincinnati, OH
45219-2199, USA.
(tel: 1-513-2210070; fax: 1-513-2210825;
E-mail: cmrs@one.net)

INTERNATIONAL CONGRESS ON COMPUTED MAXILLOFACIAL IMAGING (CMI) (2000 6 26-7 3)

venue: Hyatt Regency, San Francisco, CA, USA.
contact: Dr. Allan Farman, Univ. of Louisville, KY 40292,
USA.
(tel: 1-502-8521241)

2ND INTERNATIONAL CONFERENCE OF THE BREAST CANCER INTERNATIONAL RESEARCH GROUP (BCIRG):APPLICATION OF NEW EVIDENCE TO PATIENT TREATMENT (2000 6 26-28)

venue: Cross Cancer Institute, Edmonton, Alberta, Canada.
contact: Buksa Associates, Inc., BCIRG Conf. Secretariat,
11659-72 Avenue, Edmonton, AB T6G OB9,
Canada.
(tel: 1-780-4360983; fax: 1-780-4375984; E-mail:
bcirg@buksa.com)

CARS 2000: COMPUTER ASSISTED RADIOLOGY & SURGERY - 14TH INTERNATIONAL CONGRESS AND EXHIBITION (2000 6 8 -7 3)

venue: Hyatt Regency, San Francisco, CA, USA.
contact: Mrs. Franziska Schweikert, CARS Conference
Office, Im Gut 11, D-79790 Küssaberg, Germany.
(tel: 49-7742-91410; fax: 49-7742-4391;
E-mail: francis.cars@d-plus.net)

INTERNATIONAL PERINATAL DOPPLER SOCIETY - IPDS 2000 CONFERENCE (2000 6 29 -7 2)

venue: Taipei Int. Conv. Center (TICC), Taipei, Taiwan,
R.O.C..
contact: c/o K&A International Co., Ltd,
P.O. Box 55-1143, Taipei, Taiwan, R.O.C..
(tel: 886-2-25923918; fax: 886-2-25919345;
E-mail: knaintl@vneus.ttn.com.tw)

SUMMER ABDOMINAL IMAGING CONFERENCE (2000 7 3-7)

venue: Jackson Hole, Wyoming, Grand Teton Nat. Park,
USA.
contact: Janice Ford Benner, Univ. of PA Medical Center,
3400 Spruce Street, 1 Silverstein Bldg., Philadelphia,
PA 19104, USA.
(tel: 1-215-6626904; fax: 1-215-3495925)

MEETING ON RISK MANAGEMENT & ERROR AVOIDANCE IN CLINICAL RADIOLOGY (2000 7 7)

venue: British Institute of Radiology, London, United
Kingdom.
contact: Kitti Kottasz, BIR,
36 Portland Place, London WIN 4AT, United
Kingdom.
(tel: 44-171-3071429; fax: 44-171-3071414)

CONGRESS ON THE NEW ADVANCES IN DIAGNOSTIC IMAGING (2000 7 8-11)

venue: Rome, Italy.
contact: Prof. P. Pavone, Policlinico Umberto I, Viale Regina
Elena, 324, I-00161 Rome, Italy.
Viale Regina Elena, 324, I-00161 Rome, Italy.
(tel: 39-06-4463927/4468587; fax: 39-06-490243;
E-mail: Pavone@uniroma1.it)

22ND ANNUAL DIAGNOSTIC IMAGING CONFERENCE (2000 7 10-14)

venue: Harbor View Hotel, Martha's Vineyard, MA, USA.
contact: Janice Ford Benner, Univ. of PA Med. Center,
Radiology, 3400 Spruce Street, 1 Founders Bldg.,
Philadelphia, Pa 19104, USA
(tel: 1-215-6627825; fax: 1-215-3495925)

SIX-WEEK RADIOLOGIC PATHOLOGY COURSE (2000 7 17-25)

venue: Washington, DC, USA.
contact: Mr. Arnold Gittleson, Armed Forces Inst. of
Pathology, 14th St. and Alaska Ave. N.W.,
Washington, D.C. 20306, USA.
(tel: 1-202-7822272; fax: 1-202-7828124;
E-mail: gittleson@afip.osd.mil)

WORLD CONGRESS ON MEDICAL PHYSICS & BIOMEDICAL ENGINEERING/42ND ANNUAL MEETING AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE (2000 7 25-30)

venue: Navy Pier, Chicago, IL, USA.
contact: Lisa Rose Sullivan, Projects Manager AAPM, One
Physics Ellipse, College Park, MD 20740, USA.
(tel: 1-301-2093350; fax: 1-301-2090862;
E-mail: aapm@org)