Significance of elevation of the right dome of the diaphragm

S. RAMACHANDRAN *  
M.D., M.R.C.P., M.R.C.P.E.  

D. L. N. JAYAWARDENA  
M.B.B.S., D.M.R.D.(Lond)  

M. B. WARAKAULLE  

* The Colombo North General Hospital, Ragama, and the Colombo South Hospital, Kalubowila, Sri-Lanka

Summary
Elevation of the right dome of the diaphragm occurs in a small proportion of healthy young adults, and in a proportion of patients with cardiac disease, cirrhosis of the liver and gastroenteritis. Hence this radiological feature, although common in hepatic amoebiasis, should be considered in conjunction with the other clinical features in the diagnosis of hepatic disorders. The significance of an elevation in the right hemi-diaphragm in diseases primarily non-hepatic in origin, although of no diagnostic importance, is of clinical interest and is discussed.

Introduction
Elevation of the right dome of the diaphragm is a common radiological abnormality in the syndrome of hepatic amoebiasis (Ramachandran, Jayawardena and Perumal, 1971). Consequently, it has been included as a criterion in the clinical diagnosis of the syndrome (Lamont and Pooler, 1958). It therefore becomes necessary to establish the frequency of this radiological sign in healthy individuals, and in patients with other medical disorders in geographical locations where hepatic amoebiasis is prevalent.

Materials and methods
Postero-anterior and right lateral chest X-rays were taken in (i) 111 healthy adult males (aged 20 to 38 years, mean 24 years); (ii) 268 patients, with various medical conditions, admitted to the Medical Units of the Base Hospital, Chilaw, and the Colombo North General Hospital, Ragama, Sri-Lanka. These medical conditions included:
(a) Pulmonary diseases: acute and chronic bronchitis; tropical eosinophilia; lung consolidation and abscess; tuberculosis (eighty-five patients—fifty-six male, twenty-nine female, aged 13 to 83 years, mean 48 years).
(b) Cardiac disease: ischaemic heart disease;

Results
(i) Healthy subjects. Elevation of the right dome of the diaphragm was present in two of the 111 (1.9%) (Ramachandran et al., 1975).
(ii) Patients. The incidence of elevation of the right dome in some of the commoner medical disorders is listed in Table 1. There was a striking incidence in patients with cardio-vascular disease (34.5%), cirrhosis of the liver (34.3%) and gastroenteritis (10.5%). However, the incidence in patients with viral hepatitis was low. The overall frequency of this radiological sign in the group of 268 cases was 14.5%.

Discussion
Radiological surveillance establishes the fact that
Table 1. The incidence of an elevation of the right dome of the diaphragm in patients with some common medical disorders

<table>
<thead>
<tr>
<th>Medical disease</th>
<th>Number of cases X-rayed</th>
<th>Elevation of the right dome</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary disease</td>
<td>85</td>
<td>6</td>
<td>7.1</td>
</tr>
<tr>
<td>Cardiac diseases</td>
<td>29</td>
<td>10</td>
<td>34.5</td>
</tr>
<tr>
<td>Fever</td>
<td>18</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Gastroenteritis</td>
<td>19</td>
<td>2</td>
<td>10.5</td>
</tr>
<tr>
<td>Cirrhosis of liver</td>
<td>50</td>
<td>17</td>
<td>34.0</td>
</tr>
<tr>
<td>Viral hepatitis</td>
<td>45</td>
<td>2</td>
<td>4.4</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>22</td>
<td>2</td>
<td>9.1</td>
</tr>
<tr>
<td></td>
<td>268</td>
<td>39</td>
<td>14.5</td>
</tr>
</tbody>
</table>

Elevation of the right dome of the diaphragm occurs in a small proportion of healthy young adults, and in a high proportion of patients with cardiac disease, cirrhosis of the liver and gastroenteritis. It follows that this radiological sign is not peculiar to the syndrome of hepatic amoebiasis.

The occurrence of an elevation of the right hemidiaphragm in otherwise healthy young adults is relevant to the certifying of medical fitness for life insurance. The aetiological factors producing elevation could be either abnormal posture and spinal deformities, congenital or acquired weakness of the diaphragmatic musculature with or without visceral herniation, or an upward enlargement of the liver (Simon, 1962). Whereas the first factor would be obvious in the chest X-rays, screening of the chest and tests for diaphragmatic movement would be necessary for detection of the latter causes.

Evaluation of the significance of this radiological sign in medical disorders is best considered, firstly, with reference to primary diseases of the liver and, secondly, in relation to diseases where hepatic involvement is of secondary importance. There is no doubt as to the value of this abnormal sign in the diagnosis of hepatic amoebiasis, whether pus is demonstrated or not. The rarity of this feature in patients with viral hepatitis and leptospirosis further indicates its clinical value. Nevertheless, its occurrence in hepatic disorders such as cirrhosis and malignancies of the liver (Rowland, 1963) shows that this radiological sign should be considered in relation to other features in the diagnosis of liver diseases, including hepatic amoebiasis.

The significance of an elevated right hemidiaphragm in diseases primarily non-hepatic in origin, although of no diagnostic importance, is of clinical interest. In patients with cardiac disease it would indicate the presence of congestive cardiac failure, while in those with colonic ulceration it suggests secondary hepatic involvement. Hepatic involvement has been recognized in ulcerative colitis and regional enteritis (Dordal, Glagov and Kirsner, 1967), and in intestinal amoebiasis (Ramachandran, Sivalingam and Perumal, 1973; Ramachandran et al., 1973). Further to this study, this radiological feature has been observed in neoplastic diseases such as chronic myeloid leukaemia. Phrenic nerve involvement should be excluded in cases of elevation of the right dome of the diaphragm in pulmonary disease.

References


Significance of elevation of the right dome of the diaphragm

S. Ramachandran, D. L. N. Jayawardena and M. B. Warakaulle

*Postgrad Med J* 1976 52: 154-155
doi: 10.1136/pgmj.52.605.154

Updated information and services can be found at:
http://pmj.bmj.com/content/52/605/154

These include:

**Email alerting service**
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/