AN UMBILICAL/PARAUMBILICAL HERNIA AS A SIGN OF AN INTRAABDOMINAL MALIGNANCY IN THE ELDERLY

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The umbilical area can present with a variety of signs associated with an intra abdominal malignancy. The most common reported sign is the “Sister Mary Joseph’s Nodule”, which is caused by tumor metastasis to the periumbilical region; this was first described by a nurse at the Mayo Clinic who prepared the abdomen of patients before surgery and noticed a correlation between the presence of an umbilical nodule and an intra abdominal malignancy (1). The presence of the “Sister Mary Joseph’s Nodule” can be mistaken for an umbilical/paraumbilical hernia; one or both pathologies can be present simultaneously (2, 3, 4).

An umbilical/paraumbilical hernia itself can be a sign of an internal malignancy (4). Hernias are very common conditions that most surgeons diagnose and treat in daily practice. Umbilical hernias account for 5-7% of all hernias; however, there is data suggesting a substantially higher rate, up to 14% (8, 9). Most umbilical hernias are acquired; the associated major risk factors are: increased intra abdominal pressure as noted in obese patients, pregnancy, the presence of an intra abdominal mass, and ascites caused by cirrhosis, or peritoneal carcinomatosis (1, 9).

The correlation between the presence of an umbilical/paraumbilical hernia and an intra abdominal malignancy is solely based on prior case reports (3-6).
There is no data in the medical literature on the prevalence of a malignancy among patients with an umbilical/paraumbilical hernia. Therefore, the aim of this study was to evaluate the significance of an umbilical hernia as a sign of an intra abdominal malignancy.

MATERIAL AND METHODS

Study population

A retrospective analysis was performed of medical records including patients treated at a tertiary care teaching hospital during the period ranging from 2005-2013. Patients with a medical history of an umbilical/paraumbilical hernia, as the primary or concurrent diagnosis, were selected and analyzed with the regard to the presence of an intra abdominal malignancy, at the time of hospital admission, for a hernia or after a past hospitalization for a hernia. The umbilical hernia was recorded as associated with a malignancy if it was observed no more than 12 months before the diagnosis of the malignancy, or if the malignancy was diagnosed no more than 12 months after a hernia repair. The demographic and clinical data, biochemical parameters, as well as type of neoplasm were evaluated.

Institutional ethical board approval was not required for this type of retrospective research at our institution.

Definition of factors used in this study:

1. Symptom-free preoperative status: the patient did not report any abdominal symptoms on history.
2. Anemia: a blood hemoglobin level less than 12g/dl.
3. Changes in bowel habits: a change in the frequency (defined as >3 bowel movements per day or <3 bowel movements per week), the consistency or in the caliber of the stools persisting for at least three weeks and not observed by the patient previously.
4. Weight loss: unintentional decrease in weight >5% in the last 3 months and/or >10% in the last 6 months.

Statistical analysis

Qualitative and quantitative data were used to describe the study results. Quantitative parameters are expressed as the mean value ± standard deviation. The remaining cases have been summarized as counts and percentages.

The data were analyzed using STATISTICA 10.0 software (StatSoft). The Shapiro-Wilk W and the Kolmogorov-Smirnov tests, with the Killieifors correction, were used to confirm the normality of the distribution of the results. Continuous variables were compared using the Student’s t test for normally distributed data and the Mann-Whitney test was used for skewed data. Categorical data were compared using chi2 analysis or Fisher’s exact test. In order to identify possible effect modifiers, the effect of the interaction between each variable of interest was examined and the risk for a coexistent malignancy assessed in separate logistic regression models. The final multivariate logistic regression model included all variables that were significantly associated with all significant interactions. Statistical significance was defined as a two-sided p ≤ 0.05.

RESULTS

During the study period 145 patients with an umbilical/paraumbilical hernia were treated at our department. The group consisted of 113 (78%) women and 32 men (22%). The mean age was 66.4±11.9 and there was no significant difference between female patients 67.7±11 and male patients 62±13 with regard to age. Twenty-three patients (15.9%) were diagnosed with an intra abdominal malignancy (15 females, 8 males). The patients identified with a malignancy were significantly older than those without a malignancy (74.3 ± 5.5 vs 64.9 ± 12.2).

A detailed comparison of the demographic and clinical data of the patients with and without a malignancy is presented in tab. 1.

The most common malignancy identified was colorectal cancer (14 patients: 61%), followed by pancreatic cancer (4 patients: 17.4%), and malignant tumors of the adnexa (3 patients: 13%) and kidneys (2 patients: 8.7%). Thirty-six patients (25%) received emergency surgery (9 patients from the malignancy group – 39%) and 27 patients without a malignancy (22%). Fifteen patients with a malignancy had the diagnosis made postoperatively (65%); within the same hospital admission as the surgery or up to 12 months after the hernia surgery.
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Risk factor analysis

Risk factor analysis performed by univariate logistic regression showed that age, the presence of preoperative symptoms, anemia, and weight loss were statistically significant risk factors associated with the presence of an intra abdominal malignancy. The remaining factors including: gender, emergency surgery, abdominal pain, and change in bowel habits were not statistically significant risk factors (tab. 2). Multivariate analysis demonstrated that age, the presence of preoperative symptoms, anemia, and weight loss were independent risk factors. The fit of the model was good in all cases, as shown by the Hosmer and Lemeshow tests (p>0.05).

Elderly patients

As noted, patients with a malignancy identified were significantly older than those without a malignancy (74.3 ± 5.5 vs. 64.9 ± 12.2).

After dividing the patients into two groups, <75 and >75, 34% (14) of the patients >75 were diagnosed with a concomitant malignancy vs. 8.7% (9) <75 years of age; this difference was significant (<0.01). Therefore, one third of the patients in the >75 group were diagnosed with cancer. Almost three fourths of the patients with a malignancy were men; one third were women. Moreover, only two patients (5%) with cancer were asymptomatic vs 44% with no malignancy (tab. 3).

**DISCUSSION**

This is the first study of the association of an umbilical hernia with intra abdominal malignancies. Since prior reports are from single cases there is no information in the medical literature on the prevalence of malignancies among the patients with an umbilical/paraumbilical hernia. In this study 16% of patients with a hernia were diagnosed pre- or postoperatively with a malignancy.

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**Table 1. Comparison of hernia patients with and without intraabdominal malignancy**

<table>
<thead>
<tr>
<th>Bez nowotworu / No malignancy</th>
<th>Z nowotworem / With malignancy</th>
<th>Wartość p / p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients (n)</td>
<td>122</td>
<td>23</td>
</tr>
<tr>
<td>Female/male ratio (n)</td>
<td>98/24</td>
<td>15/8</td>
</tr>
<tr>
<td>Age female/male (years ± sd)</td>
<td>66±12/58±13</td>
<td>75±4/72±8</td>
</tr>
<tr>
<td>Elective/emergency surgery ratio (n)</td>
<td>95/27</td>
<td>14/9</td>
</tr>
<tr>
<td>Without any preoperative symptoms (n)</td>
<td>74 (61%)</td>
<td>5 (22%)</td>
</tr>
</tbody>
</table>

**Concomitant symptoms**:  
- abdominal pain: 32 (26.2%) vs. 18 (78.3%); <0.01  
- anaemia: 15 (12.4%) vs. 13 (56.5%); <0.01  
- changes in bowel habits: 6 (4.9%) vs. 8 (34.8%); <0.01  
- weight loss: 3 (2.5%) vs. 11 (47.8%); <0.01  

ns – no significance, SD – standard deviation, some of the patient presented with more than one symptom

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This is the first study of the association of an umbilical hernia with intra abdominal malignancies. Since prior reports are from single cases there is no information in the medical literature on the prevalence of malignancies among the patients with an umbilical/paraumbilical hernia. In this study 16% of patients with a hernia were diagnosed pre- or postoperatively with a malignancy.
Only one publication by Bender et al. reports on the number of hernia-associated malignancies; the author’s literature search revealed only 26 such cases, with an estimated prevalence of <0.1% among all hernias. However, this number includes only cases with incarcerated hernias and/or those containing a malignancy within the hernia sack (10). In this case series of patients with a malignancy, 6.2% had incarcerated hernias. However, none of the cases had a tumor inside of the hernia sack.

The standard preoperative diagnostic evaluation for patients with an uncomplicated small/medium hernia often consists of a medical history and physical examination, biochemical testing and ultrasound of the abdomen, including the area of the hernia. For most of our patients with a malignancy, this diagnostic evaluation was insufficient (65% of the patients had the malignancy diagnosed post-operatively). This is particularly important because most of these patients had a small hernia orifice, which did not allow for accurate manual exploration of the abdomen. Due to the retrospective nature of this study we do not have detailed data on the surface of the hernia orifice. However, an analysis of the surgery notes revealed that in over 80% of cases the defect in the fascia did not allow for abdominal exploration. Moreover, widening of the fascia defect without a specific indication is not standard practice. Currently, there is also no literature on this subject with regard to laparoscopic treatment of an umbilical hernia. There is no routine assessment of all abdominal organs during laparoscopic hernia repair apart from the preoperative evaluation of suspected lesions or visible findings noted after trocar placement.

Routine detailed preoperative diagnosis including computer tomography and/or colonoscopy in all patients qualified for small/medium hernia surgery with no alarming symptoms (such as anemia, significant weight loss and change in bowel habits) is controversial; there is no evidence based data regarding this subject. In a high-risk group, such as elderly patients with clinical and biochemical symptoms, this type of diagnostic evaluation should be considered prior to surgery; also prior to emergency surgery if it does not delay the treatment. In this case series five patients (22%), including two patients (4.9%) in the >75 group, did not report any symptoms. However, ten patients (43.5%) had reported abdominal pain that could be associated with the presence of a hernia.

Primary malignancies of the umbilicus are rare; the majority are metastatic lesions, with the primary sites most commonly including the stomach, pancreas, colon, and ovaries. These malignancies can be misdiagnosed as an incarcerated umbilical hernia. Occasionally, incarceration of an umbilical hernia may result from a primary intrahepatic neoplasm, typically a colon carcinoma (11).

The major limitations of this study were its retrospective design and selected group of patients admitted to a surgical ward.

**CONCLUSIONS**

Elderly patients that qualify for surgery of an umbilical/parumbilical hernia may require a more intensive preoperative evaluation. This is particularly important because most such patients have a small/medium hernia orifice, which does not allow for accurate manual abdominal exploration. Routine preoperative diagnosis, in high-risk patients, is likely to be insufficient.
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REFERENCES


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