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Headache in an emergency room

In this issue of the journal, Bigal M, et al1 relate their experience of headache in the emergency room of the Hospital of the University of São Paulo at Ribeirão Preto (São Paulo State), a tertiary care facility. They conclude that the ability to solve simple cases of headache at primary care units in this area is very low, and in consequence a great number of cases proceed to the tertiary care facility for medical diagnosis. This finding is at odds with the quality of medical care in this region of the São Paulo State, which has an excellent physician/population ratio and is strongly influenced by the School of Medicine at USP-Ribeirão Preto. This paper, “Headache in an emergency room in Brazil” challenges us to discuss how to share the responsibility of primary care units and high-tech hospitals. In this case, the question is: Are headaches a problem for primary care physicians or for neurologists in a hospital?

The first step towards answering the question is to evaluate how common headaches are in Brazil. Few papers have been published on this, although the existing data show a prevalence rate as high as that observed in other countries.2 The second step is to evaluate how severe the headache attacks are in Brazil. As the authors pointed out, most patients who sought out the emergency room had migraine, chronic daily headache or tension-type headache as their diagnosis. The final step is to evaluate the cost of treatment at a primary care unit against the approach at an emergency room. In rich countries, e.g. the United States, where the focus of medical care is on high technology, the cost of diagnostic procedures is increasing, but the quality is not keeping pace.

Our conclusion is that most patients with headache must be assisted in a primary care setting. However, we need to discuss why the emergency room is so attractive to most headache sufferers. We may speculate that shifting the complaint to the emergency room is a consequence of a lack of Family Physicians, General Practitioners, General Internal Medicine Specialists, or using the Brazilian expression, “Clínicos Gerais”. This kind of physician can diagnoses and treats the majority of headaches within normal clinical practice. This medical doctor would be a senior physician, with great expertise on the main guidelines for treatment of the most common diseases and with specialization in the treatment of minor symptoms. Nowadays, many general practitioners do not have access to these main treatment guidelines. Equipping general practitioners with these guidelines to be used in their routine activities will be a very important decision to make within the field of public health.

In 1988, the International Headache Society (IHS) distributed international criteria for the classification of headache, including the most common symptoms in each type of headache and the laboratory investigation necessary for the diagnosis of primary and secondary headache.3 In this manual, the medical diagnosis of primary headache is discussed. It is noted that this is mostly clinical and based on the symptoms that patients complain about. Wide distribution of this manual can diminish the cost and improve the quality of medical care. Only those patients with complex headache or suspected subarachnoid hemorrhage need to be transferred to hospital to permit a broader neurological approach with more specific radiological or laboratory investigation.

Returning to our starting point, a wide-ranging discussion on the most important guidelines in association with a consideration of the minor symptoms can drastically change the primary care diagnosis of some complaints, leaving the more complicated cases to the specialist, when broader investigative support is necessary.

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References

ing the year of 1996 with a complaint of headache were studied retrospectively. Since the hospital is a reference unit it receives patients from an extensive region which includes not only the municipality (population of approximately 450,000), but also towns located more than 200 km from Ribeirão Preto. Patients seen at primary health care units are referred to this unit when they are refractory to treatment or when doubts exist about the primary etiology of their complaint. As they arrive at the ER, the patients are seen by the Neurology team which consists of three residents and a supervisor with specialization in Neurology. A detailed clinical-neurological examination is performed and the patients receive parenteral analgesics or anti-inflammatory agents.

A total of 1254 patients arrived at the ER with a complaint of headache in the year of 1996. Of these, 1190 were discharged before 12 hours of permanence on the basis of a significant improvement or absence of headache and of normal clinical-neurological and subsidiary exams. The patients who spend more than 12 hours in the observation rooms are considered to have been hospitalized by the statistics service of the hospital.

The present series consists of a random sample of 165 non-hospitalized patients and of all the hospitalized patients (N = 64).

Headache was classified into 3 groups according to etiology: 1) primary headache (with the pain episode fulfilling IHS7 criteria for primary headache), 2) headache secondary to neurological disorders, and 3) headache secondary to systemic disorders. The patients were then studied in terms of clinical and epidemiological aspects and submitted to laboratory tests.

RESULTS

In 1996, 1254 patients were referred to the ER with a complaint of headache. Of these, 769 were women (61%) and 485 were men (39%). Most patients (94.9%) spent less than 12 hours in the ER. Only 64 patients (5.1%) were hospitalized, i.e., they spent more than 12 hours in the hospital environment. Patient distribution by age is given in Table 1.

About 80% of patients were less than 40 years old. The proportion of hospitalized patients was higher among subjects either younger than 10 years or older than 50 years. The age range that least required hospitalization was 40-50 years. Table 2 shows the etiologies of the headaches presented by the patients of the present series.

Primary headaches predominated among non-hospitalized patients (77.0%), whereas the percentage of headaches secondary to neurological disorders was higher among patients who required hospitalization (51.5%). However, this proportion varied widely with age range, as shown in Figure 1.

The various types of primary headaches detected in the present series of patients, according to the IHS classification, are listed in Table 3. It can be seen that 77% of the non-hospitalized patients (Table 2) had primary headache, with 56.4% of the total presenting migraine (Table 3). If we add this value to that obtained for tension headache (15.1%), we can see that 71.5% of the patients seen in the ER of a tertiary care unit did not require hospitalization and presented migraine headaches.

### Table 1 - Distribution by age of non-hospitalized and hospitalized patients

<table>
<thead>
<tr>
<th>Age(years)</th>
<th>Total group of patients</th>
<th>Hospitalized Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 9</td>
<td>127 (10.1)</td>
<td>14 (21.9)</td>
</tr>
<tr>
<td>10 - 19</td>
<td>251 (20.0)</td>
<td>11 (17.2)</td>
</tr>
<tr>
<td>20 - 29</td>
<td>391 (31.2)</td>
<td>12 (18.8)</td>
</tr>
<tr>
<td>30 - 39</td>
<td>231 (18.4)</td>
<td>8 (12.5)</td>
</tr>
<tr>
<td>40 - 49</td>
<td>144 (11.5)</td>
<td>7 (10.9)</td>
</tr>
<tr>
<td>50 and more</td>
<td>110 (8.8)</td>
<td>12 (18.7)</td>
</tr>
<tr>
<td>Total</td>
<td>1254 (100)</td>
<td>64 (100)</td>
</tr>
</tbody>
</table>

% given in parenthesis.

### Table 2 - Distribution by etiology of the headaches presented by non-hospitalized and hospitalized patients

<table>
<thead>
<tr>
<th>Non-hospitalized</th>
<th>Hospitalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary headache</td>
<td>127 (77.0)</td>
</tr>
<tr>
<td>Headache secondary to neurological disorders</td>
<td>15 (9.1)</td>
</tr>
<tr>
<td>Headache secondary to systemic disorders</td>
<td>23 (13.9)</td>
</tr>
<tr>
<td>Total</td>
<td>165 (100)</td>
</tr>
</tbody>
</table>

*Random samples, **Total number of hospitalized patients; % given in parenthesis.

### Table 3 - Primary headaches diagnosed in hospitalized and non-hospitalized patients

<table>
<thead>
<tr>
<th>Non-hospitalized</th>
<th>Hospitalized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migraine</td>
<td>93 (56.4)</td>
</tr>
<tr>
<td>Migraine without aura</td>
<td>62 (37.6)</td>
</tr>
<tr>
<td>Migraine with aura</td>
<td>27 (16.3)</td>
</tr>
<tr>
<td>Typical aura</td>
<td>23 (13.9)</td>
</tr>
<tr>
<td>Basilar</td>
<td>4 (2.4)</td>
</tr>
<tr>
<td>Migraine complications</td>
<td>4 (2.4)</td>
</tr>
<tr>
<td>Status migranosus</td>
<td>3 (1.8)</td>
</tr>
<tr>
<td>Migraine infarction</td>
<td>1 (0.6)</td>
</tr>
<tr>
<td>Tension-type</td>
<td>25 (15.1)</td>
</tr>
<tr>
<td>Cervicogenic</td>
<td>2 (1.2)</td>
</tr>
<tr>
<td>N euralgia</td>
<td>1 (0.6)</td>
</tr>
<tr>
<td>Chronic daily</td>
<td>2 (1.2)</td>
</tr>
<tr>
<td>Converse</td>
<td>3 (1.8)</td>
</tr>
<tr>
<td>Benign, due to effort</td>
<td>1 (0.6)</td>
</tr>
<tr>
<td>Total</td>
<td>127 (77.0)</td>
</tr>
</tbody>
</table>

% given in parenthesis.
women and in younger ages. A larger number of hospitalizations was indicated for patients younger than 10 or older than 50 years. A greater percentage of headaches secondary to systemic disorders was observed in these age ranges. These findings are similar to those found by others.9-12,16-18

A complete work-up was performed on 17.6% of non-hospitalized patients and on 75% of hospitalized patients. Among non-hospitalized patients, 77% received a diagnosis of primary headache and among the hospitalized ones 70.3% received a diagnosis of secondary headache (Table 2). These data suggest that when the pain persists after several hours and after the administration of analgesics, neurological exams should be repeated and specialized tests such as CT scans, magnetic nuclear resonance and/or spinal tap should be carried over since there is an increased possibility of the presence of secondary headache. Moreover, these data might serve as the basis for an organized clinical reasoning at a time of cost rationalization.

In the evaluation of the medical performance of general clinicians at primary health care centers two facts were particular outstanding: 1) a small number (5.1%) of the patients referred to the ER required hospitalization, and 2) 71.5% of these patients had primary headaches that responded well to symptomatic treatment of the pain and were discharged after this procedure. This being a tertiary care unit, a higher percentage of secondary headaches was expected to be diagnosed.

The above data, taken as a whole, show that most of the patients with primary headaches were young and did not require complementary tests, i.e., they presented disorders that could have been resolved at the primary care units. Referral of patients with benign disease to a tertiary care unit raises concerns about costs and efficiency, a much debated topic in developed countries. In developing countries this fact acquires even greater importance because of the lower structuring of the health system, the precarious state investments and the low economic level of the underprivileged population. The system is insufficient to guarantee quality care in view of the high demand. When a patient is improperly referred, costly and unnecessary consequences occur: mobilization of transport with a specialized vehicle and personnel (ambulance), the hospital receiving the patient often works under conditions of overcrowding, with aggravation of the lack of beds and physicians for more serious cases. Improper referral causes a greater delay in the resolution of the problem, with a consequent prolongation of patient suffering and separation from his work, his family or his well-deserved rest. In addition, operational costs are greatly increased.

CONCLUSIONS

We conclude that the resolution power of the primary health care system in the Ribeirão Preto region in terms of the headache symptom is very low. It should be pointed out that this region is considered to be one of the best medical centers by Brazilian doctors. Thus, it can be seen that headache, as well as precordial pain, frightens general practitioners, generating insecurity among non-specialists, with consequent diagnostic difficulties. However, in contrast to precordial pain, well-established criteria (IHS) are available for headache and in most cases a diagnosis can be made without the use of laboratory tests. Thus, there is a pressing need for a more aggressive dissemination of the diagnostic criteria of the H1S, which would lead to more space for more serious cases in tertiary care units, with decreased operational and individual costs.

REFERENCES

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Comparison of vaginal wall sling and modified vaginal wall sling for stress urinary incontinence

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abstract

CONTEXT: There are several controversies about which is the best form of surgical treatment for stress urinary incontinence in women. The vaginal wall sling in its original and modified form were presented by Raz as new options for treatment of these conditions, but there is a lack of comparative clinical trials using both techniques.

OBJECTIVE: To compare the effectiveness of the original and the modified vaginal wall sling.

DESIGN: A comparative, prospective, non-randomized clinical trial.

SETTING: Public and private health care units (Urology Division, Faculty of Medicine of the ABC Foundation, and Universidade Federal de São Paulo / Escola Paulista de Medicina).

PARTICIPANTS: Twenty patients with anatomical and intrinsic sphincter deficiency stress urinary incontinence were surgically treated for evaluating the initial results of the vaginal wall sling, from February 5, 1994, to June 27, 1996.

INTERVENTIONS: The patients were divided into two groups. Group A (n = 10) were treated with the original vaginal wall sling. Group B (n = 10) were treated with the modified vaginal wall sling. Both groups were statistically similar according to clinical and urodynamic parameters.

MAIN MEASUREMENTS: Cure and complication rates.

RESULTS: Follow-up ranged from 19 to 43 months (median = 28) for group A. The overall cure rate was 70%. Fifty per cent of the patients had urinary retention of 7 to 35 days. There were no major complications. Follow-up ranged from 14 to 26 months (median = 18) for Group B. The cure rate was 80%. Two patients had urinary retention of 7 and 55 days. There were no major complications.

CONCLUSIONS: The vaginal wall sling is as effective as the modified vaginal wall sling but has a higher rate of urinary retention.


INTRODUCTION

There are several controversies about which is the best form of surgical treatment for women with stress urinary incontinence.¹⁻⁵ The surgeon's choice is based on the type and severity of incontinence, number of previous anti-incontinence procedures, hormonal status, urodynamic parameters and personal preferences.

Type III stress urinary incontinence is the involuntary loss of urine due to an intrinsically damaged urethra (intrinsic sphincter deficiency), with or without hypermobility.¹ Patients with this type of stress urinary incontinence are best treated by slings, a procedure where a sling is harvested from fascia, muscles, vaginal wall or synthetic material and is transplanted to the suburethral area to compress and support the proximal urethra. Anatomical stress urinary incontinence is the involuntary loss of urine due to hypermobility of an intact sphincter unit. Patients with this type of incontinence may be treated with slings, but traditionally they are not, because of bladder emptying disturbances produced by this type of procedure. In this case, Burch's colposuspension is the procedure of choice.

In 1994, Young et al. modified the Raz vaginal wall sling⁴ for application in patients with anatomical and intrinsic sphincter deficiency.⁶ In this technique, there is no real sling, but two pairs of sutures placed at the level of the middle urethra and at the bladder neck.

We present a comparison of the Raz vaginal wall sling with Young's modified vaginal wall sling in pa-
Decisions are closed without epithelial superpositioning. The other steps of the procedure are identical.

All patients received antibiotic prophylaxis with cephalosporins before surgery, which was maintained until the urethral catheter was removed.

**Main measurements**

At follow-up patients were considered cured, if completely dry; improved, if they had leakage at a lower grade (meaning leakage that did not need continuous use of pads or any other protective measure); or failed, if equal or worse. Postoperative examination included interview with one of the authors (CAB) for urinary symptoms, physical examination and trouble with sexual activity. No specific questionnaires or third party analysis were done. Patients were systematically evaluated at 1, 3, 6, 12, 18 and 24 months after the procedure. Urodynamics were done only if the patient had failure or complication, and accepted this.

**Statistical methods**

The Mann-Whitney test was applied for comparison of the groups, with the limit of 5% ($P < 0.05$) for the null hypothesis. The variables studied were effectiveness, defined in terms of number of patients cured or improved, and complication rates, defined in terms of voiding disturbances and sexual impairments.

**RESULTS**

**Baseline comparisons**

The two groups were comparable since they were statistically similar (Table 4).

**Main outcomes**

For the patients in group A, follow-up ranged from 19 to 43 months (median 28); seven patients were cured or improved and 3 failed. Among the 3 failures (patients 1, 7 and 9 - Table 2), one occurred in the immediate postoperative period (patient 9), one at thirty days (patient 1) and one at 11 months (patient 7) after the procedure. Two of them (patients 1, 7) were urodynamically evaluated, confirming the persistence of stress urinary incontinence with a stable bladder. Both were reoperated and remained cured after 12 months of follow-up. The third patient (patient 9), who failed immediately, refused evaluation and treatment. She was reoperated at another institution and is still incontinent.

Of the patients with surgical success, five were cured and two were improved (patients 2 and 5) and demanded no further treatment. One of the latter (pa-

<table>
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<th>Age</th>
<th>Previous Surgeries</th>
<th>Peak flow (ml/s)</th>
<th>Leak point pressure (cm H2O)</th>
<th>End filling pressure (cm H2O)</th>
<th>Voiding pressure (cm H2O)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>46</td>
<td>1 - KK</td>
<td>16</td>
<td>49</td>
<td>14</td>
<td>08</td>
</tr>
<tr>
<td>2</td>
<td>59</td>
<td>1 - KK</td>
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<td>-</td>
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<td>02</td>
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<tr>
<td>3</td>
<td>57</td>
<td>2 - KK-B</td>
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<td>08</td>
<td>03</td>
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<td>6</td>
<td>57</td>
<td>2 - KK-G</td>
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<td>7</td>
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</tbody>
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Legend: names of previous procedures: KK = Kelly-Kennedy; B = Burch; R = Raz; G = Gittes.

<table>
<thead>
<tr>
<th>Patients</th>
<th>Age</th>
<th>Previous Surgeries</th>
<th>Peak flow (ml/s)</th>
<th>Leak point pressure (cm H2O)</th>
<th>End filling pressure (cm H2O)</th>
<th>Voiding pressure (cm H2O)</th>
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<td>1 - B</td>
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<td>15</td>
</tr>
</tbody>
</table>

Legend: names of previous procedures: KK = Kelly-Kennedy; B = Burch; R = Raz; G = Gittes.
low-up. Two of them were due to incorrect application of the operative technique, since when they have been reoperated, one with the same technique and the other with the fascial sling and both are now continent. The third patient was reoperated in another institution and is still incontinent, suggesting she has a severe incontinence problem that is difficult to treat with any surgical technique.

In group B one failure occurred in a patient with detrusor instability, and it is known that the results are bad when mixed incontinence is present. The second failure was a technical problem, since one of the sutures broke during surgery.

There were no major complications in either group, except for urinary retention, with a higher grade in group A (50% versus 20%). Despite this, only one of the twenty patients has a persistent bladder-emptying problem (patient 19, group B).

At present, the surgical treatment of stress urinary incontinence has several points of controversy. In large reviews of this theme, it is suggested that the best procedure for anatomical incontinence is colposuspension (Burch procedure) and for intrinsic sphincter deficiency is slings. In spite of this, we need to ask which type of sling is the best (rectus fascia, cadaveric fascia lata, vaginal wall), and whether both types of stress incontinence must be treated with slings. Some recent publications refer to slings as the best choice for all types of stress urinary incontinence. Others question this suggestion. To correctly answer these questions, more clinical trials targeting this issue are needed. This study is an initial protocol to compare two variations of vaginal wall slings, used in both types of stress urinary incontinence. Other authors have published articles with the modified vaginal wall sling, but not with a comparative trial. At this time, our sample and follow-up are too small to adequately answer the doubts. But it is the first comparative study with these two variations of vaginal wall sling and we are still working on it.

In patients with stress urinary incontinence, the modification suggested by Young has the advantage of eliminating the risk of cyst formation and vaginal shortening but has the disadvantage of not harvesting a substantial amount of vaginal tissue in the suburethral space. This, in our series, did not affect the initial results.

**CONCLUSION**

The modified vaginal wall sling is as effective as the original vaginal wall sling, in the initial follow-up, and both have minimal morbidity. Other series of patients with greater number of cases and longer follow-up are necessary to confirm these results.

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INTRODUCTION

The large number of histological types of tumors in salivary glands makes them a very heterogeneous group of neoplasias. The greatest difficulties in their identification are due to the morphological variety and complexity that compromise the histopathological diagnosis and classification of these tumors.1

Mucoepidermoid carcinoma (MEC) represents 5 to 12% of salivary gland tumors, with the most common site being the parotid gland (70 to 90%).2-7 In the oral cavity, the palate is the most affected site and the lip is the site with least incidence.8

In addition to the cytological and morphological properties of these neoplasias, one of the most important criteria for the measurement of their biological behavior and aggressiveness is cell proliferation. In this way, immunohistochemical markers of cell proliferation have been found to be useful in tumor classification and have formed part of the prognostic and therapeutic studies of these pathologies.9,10

The proliferating cell nuclear antigen (PCNA) identified by Miyachi et al11 is a 36 kd, acidic, non-histone nuclear protein that helps the delta DNA polymerase in DNA synthesis.12 This protein has a high concentration in the late G1 and early S phases, diminishes in the G2 phase and is almost absent in the M phase.12,13

The evaluation of cell proliferation using PCNA is comparable to and, under certain conditions, superior to the traditional methods of mitotic

abstract

CONTEXT: Among the cytological and morphological properties of mucoepidermoid carcinoma, one of the most important criteria for measuring its biological behavior and aggressiveness is cell proliferation. In this way, immunohistochemical markers of cell proliferation have been found to be useful in tumor classification and have formed part of the prognostic and therapeutic studies of these pathologies.

OBJECTIVE: To analyze 11 cases of mucoepidermoid carcinoma (MEC) using the proliferation activity marker (PCNA) and to determine its relationship to the grade of malignancy of these tumors.

DESIGN: Correlation study.

SETTING: Head and Neck Surgery Department of Heliópolis Hospital, São Paulo, Brazil.

SAMPLE: Slides of 11 cases of primary mucoepidermoid carcinomas of salivary glands were prepared according to routine techniques employed in the Oral Pathology Department of the Dentistry Faculty of São Paulo University, Brazil. They were fixed in a 10% formaldehyde solution and stained with hematoxylin and eosin. After this preparation the tumors were classified as low, intermediate and high grade of malignancy, according to the criteria established by Seifert & Sobin and Auclair, Gooe & Ellis. The slides were sent for immunohistochemical processing to evaluate the positivity of proliferating cell nuclear antigen using the streptavidin biotin technique.

MAIN MEASUREMENT: The correlation between proliferating cell nuclear antigen expression and the histological malignancy grade in mucoepidermoid carcinoma of salivary glands.

RESULTS: there were 4 cases (36%) of low grade, 4 cases (36%) of intermediate grade and 3 cases (27%) of high grade of malignancy. After a comparative study between histological features and immunohistochemical analysis, significant differences were observed (P < 0.01) for low, intermediate and high grades: 16.04%, 26.98% and 56.98% of proliferating cell nuclear antigen expression in mucoepidermoid carcinoma, respectively.

CONCLUSION: The proliferating cell nuclear antigen expression increases with the grade of malignancy in mucoepidermoid carcinoma of salivary glands.

in less than 10% (Figure 3).

b) Immunohistochemical study for PCNA determination. For immunohistochemical PCNA detection, the streptavidin biotin technique was used. The monoclonal antibody used was PC10 (DAKO Corporation, Glostrup, Denmark) in a 1/100 dilution with 18 hours incubation time. Tumor cells that showed a brownish stain were considered positive (Figure 4). The quantitative expression of PCNA was obtained from the relationship between the number of PCNA-positive cells and the total number of evaluated cells in percentage terms. The total number of evaluated cells was never less than 1000 cells in each procedure. Two evaluations were performed for each tumor. In all cases the immunohistochemical evaluation of PCNA was performed by the pathologist in a blind manner (without knowing the histopathological diagnosis or the malignancy grade).

**Main Measurement**

The correlation between PCNA expression and the histological grade of malignancy in MEC of salivary glands.

**Statistical methods**

The statistical analysis was performed using the SAS/STAT program, users’ guide version 6.0 (SAS Institute Inc., 1989), to organize the prediction interval for the three grades of malignancy. Student’s t distribution test and Tukey’s multiple comparison test were used to evaluate the differences between the obtained data.

**RESULTS**

**Clinical data**

The clinical data of the 11 patients are shown in Table 1. The median age was 45.7 years (range 36-75). Nine patients were white, 1 black and 1 unknown. The male to female proportion was approximately 1:1 (6 male and 5 female). The primary tumor sites were: parotid gland (64%), hard palate, base of tongue, submaxillary gland and mouth floor (9% each). The mean duration of complaints was 5.6 years and the mean tumor size was 5.3 cm. Seven patients were asymptomatic and only 4 presented symptoms at the time of diagnosis.

**Histopathological and immunohistochemical findings**

The results of histopathological evaluation showed 4 cases (36%) classified as low grade, 4 cases (36%) intermediate and 3 cases (27%) as high malignancy grade. Table 2 presents the relative and absolute values of PCNA-positive cells in the two
Contrary to the results obtained by Tsai & Jin,27 the data of the present study showed a statistically significant difference between the malignancy grades and the expression of PCNA in tumor cells, as evaluated by the percentage of positive cells. Tumors with a high grade of malignancy showed a greater percentage of PCNA-positive cells than the tumors with intermediate or low grade.

These findings suggest that the evaluation of PCNA expression in MEC of salivary glands can be used as a complementary procedure for appropriate classification of these tumors. Therefore, more studies are necessary to determine the role of PCNA positivity in treatment and prognosis of these tumors.

### Table 3 - Mean percentage and dispersion values of proliferating cell nuclear antigen (PCNA+) cells for all patients and in each group according to the histopathological classification

<table>
<thead>
<tr>
<th>Histopathological Classification</th>
<th>Malignancy grade</th>
<th>Statistical parameters</th>
<th>Relative values of PCNA+ cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>All groups</td>
<td>n Mean</td>
<td>11 (18.9)</td>
<td>32.2%</td>
</tr>
<tr>
<td>Low grade group</td>
<td>n Mean</td>
<td>4 (1.6)</td>
<td><em>16.0%</em></td>
</tr>
<tr>
<td>Intermediate grade group</td>
<td>n Mean</td>
<td>4 (8.7)</td>
<td>29.7% *</td>
</tr>
<tr>
<td>High grade group</td>
<td>n Mean</td>
<td>3 (14.8)</td>
<td>56.9% **</td>
</tr>
</tbody>
</table>

* not significant statistical difference; ** significant statistical difference (P<0.01); Standard Deviation given in parenthesis.
INTRODUCTION

DNA typing techniques are one of the most advanced tools for human identification. During the last 10 years, a great number of methods for DNA typing have been introduced to forensic science, with considerable success and also with considerable controversy. The success and validation of a criminal investigation are very closely related to the process used for obtaining and preserving biological evidence.

Genetic markers can be characterized in traces of biological fluids, such as blood, sperm, saliva, nasal secretion, fragmented skeletal remains and old bones.

In severely charred fire victims both autolytic changes as well as deleterious effects of heat will cause degradation of the DNA. Polymerase chain reaction (PCR) procedures permit reliable replication of thousand of copies of a specific DNA sequence, in vitro, and have been described and improved in recent years, allowing the study of small amounts of DNA even when degraded. These procedures are therefore extremely useful in the analysis of forensic samples. Several loci are especially suitable for PCR analysis. DNA analysis has been used with success in the identification of carbonized corpses and victims of large accidents. The analysis requires relatives of crash victims to donate blood for analysis. The relatives are generally willing contribute to the identification by giving a blood sample.

This paper describes the use of PCR for genetic characterization of one victim extensively burned by fire.
REFERENCES


7. Soares-Vieira JA. As aplicações da biologia molecular na identificação humana em manchas e crostas de sangue. São Paulo, 1998. Doctoral Thesis – Faculty of Medicine, University of São Paulo, Brazil.


Abdominal radiograms showed a bullet lodged in the left hip, with a neat bursogram of the whole synovial capsule (Figure). The patient gave the information that a gunshot accident had occurred seven years ago. Lead intoxication was then considered and blood samples were drawn for lead (PbB) and zinc protoporphyrin (ZPP) dosages. A urine sample was also collected for delta aminolevulinic acid (U-ALA) measurement. The following results corroborated the diagnosis of lead intoxication: PbB = 40.1 µg/dl (reference value for non-exposed population = 40 mg/dl); ZPP = 84.3 µg/dl (reference value = 75 µg/dl); and U-ALA = 49.2 mg/dl (reference value for non-exposed population = 6 mg/dl).

A course of chelating treatment using calcium versenate (EDTACaNa₂) intravenously was started at a dosage of 1 g per day, and continued for 6 days. During the first hours of infusion of the specific treatment, the patient showed good improvement, being free from any abdominal pain by the second day of treatment. Chelation was assessed by measuring the total amount of lead excreted in urine during each day of treatment. The total amount of lead excreted in the 6 days was 20792 mg (mean 3465 mg each day), exceeding the cutoff of 2000 mg per day that is considered to be an efficacious treatment.

After the chelation therapy the patient had recurrence of his symptoms and a radical solution for the chronic mobilization of lead was considered. A hip arthroplasty procedure was performed, leading to a complete substitution of the left hip. Histopathologic examination of the hip and the part of the femur removed, showed intense metal impregnation with granulomatous foreign body reaction around the bone tissue and synovial capsule. Osteonecrotic areas with bone marrow fat saponification were also present, and disseminated calcification was noticed. Afterwards, during clinical follow-up, the patient no longer presented any symptoms related to lead intoxication.

**DISCUSSION**

The present clinical case brings to light the importance of lead poisoning as a diagnosis for severe abdominal pain in emergency department units. Of course, occupational sources of exposure to lead are by far the most common ones, but retained bullets must be thought of as a possible source of lead if this is the case. The great number of people carrying lead bullets in some part of their bodies may increase the risk of “endogenous” intoxication by this heavy metal.

It has been observed that lead bullets in muscle or bone tissues, do not bring much trouble, as the tissue around the foreign body creates a fibrous capsule, avoiding dissolution of lead into the blood circulation². Due to physical chemical properties, metallic lead tends to dissolve in acidic media, thereby promoting absorption, distribution, and toxic effects in its target organs and tissues, such as the central and peripheral nervous systems, the enzymatic system for heme synthesis, and kidneys. This is the case when the bullet is lodged in the joints, in direct contact with synovial liquid, or in the central nervous system or spinal cord canal, in contact with cerebrospinal fluid. In the case of big joints, like hips and shoulders, patients must not be lost to follow-up after emergency first care, and doctors must plan on early excision of the bullet, to avoid the risk of late dissolution and chronic clinical lead intoxication. The chronic synovial inflammatory process generally leads to great damage of the synovial capsule and joint cartilage surface, as seen in this case. Our case is very educational in this respect, as seven years elapsed between the shot accident and the surgical procedure that followed the diagnosis of intoxication. The patient’s hip could probably have been spared if early intervention had been performed.